Winrock International Environmental Alliance

Environmental Monitoring, Evaluation, and Mitigation Plans:

A Review of the Experiences in Four African Countries

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Environmental Monitoring, Evaluation, and Mitigation Plans:

A Review of the Experiences in Four African Countries

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Preface

Rationale and Methodology for this Study

This report provides USAID's Bureau for Africa with an analytical overview of the environmental monitoring, evaluation and mitigation plans (EMEMPs) with which it tracks the relation between development activities and the environment. The first EMEMP was proposed in 1992 in Ghana. By 1994, about 25 were under development in some 16 African countries (Knausenberger 1994, 7). As more EMEMPs have been introduced, they have evolved substantially, and they now vary greatly across countries. This study is an initial attempt to observe some of those EMEMPs, to understand how their objectives and implementation strategies have developed, identify patterns among them, and to see how future work can benefit from the experience to date.

In January 1994, the Bureau's environment officer sent a cable to relevant USAID missions requesting an update on the status of their EMEMPs (U.S. Department of State 1994). Initially, this study was conceived as an analysis of the responses to that cable. They varied considerably in their depth and coverage. Some provide a thoughtful overview of progress and issues in the country involved. Others provide less detailed responses to the specific questions that the Bureau posted. The cable responses are interesting and useful, but they not provide enough information for a comprehensive and comparative analysis of the experience with EMEMPs to date.

The study was therefore modified to involve more detailed analysis of four EMEMPs for USAID activities in Ghana, Malawi, Uganda, and Madagascar. These four countries were chosen because their EMEMPs are relatively advanced (although none are beyond the early stages of implementation) and because they represent a variety of regions, experiences, and strategies. Including more countries would have been interesting but impractical. The general issues raised by the four countries should, nevertheless, be of interest to people working elsewhere.

For logistical reasons, it was possible to visit only two countries, Ghana and Uganda. The discussion of Malawi is based on extensive documentation and discussions with others who have worked there. Documentary information on Madagascar was more limited, and it was possible to speak with only a few people involved with the EMEMP, so this portion of the report is less rich in detail and may not reflect the plan's current status. Given these limitations, the study relies on the following types of information:

- The EMEMP documents. The EMEMP document is a report that describes the project or program that requires monitoring (referred to as the "EMEMP project"); summarizes anticipated impacts on the environment; and establishes a plan for monitoring, evaluating, and (if needed) mitigating those impacts. The term "EMEMP" is often used to refer to the entire process of developing and implementing a plan, so the term "EMEMP document" is used to refer to the plan itself when needed for clarity.

- Missions' annual Assessments of Program Impact (API), which describe mission goals, strategic objectives, subobjectives, and projects, and which chart progress in accomplishing strategic objectives over the year.

- Reports on indicators prepared by the Program Performance Information for Strategic Management (PRISM) Project. These reports, available for Ghana and Uganda, describe the missions' goals, strategic objectives, and subobjectives and identify indicators with which mission performance can be measured. PRISM indicators are used to prepare the annual API reports.

- Monitoring and evaluation (M&E) plans for the EMEMP projects. M&E plans address the question of how a project or program will assess the accomplishment of its direct objectives, rather than its incidental impacts on the environment. They are a required annex to the Project Paper.

- Any other environmental monitoring plans, reviews, and assessments, as well as similar documents prepared for the EMEMP project or other related USAID projects expected to provide data for the EMEMP.

- Responses to the Department of State's cable, which was noted above.

- Any memos, e-mail, trip reports, meeting notes, or other documents that shed additional light on the EMEMP.

- Personal or telephone interviews with USAID staff and contractors based in North America who are involved with EMEMPs, an EMEMP project, or related activities for the four countries.

- Personal interviews with USAID mission staff, project staff, and African government officials involved with EMEMPs, EMEMP projects, or related activities in Ghana and Uganda. The two trips occurred in May and June 1994.

List of Acronyms

ADB	African Development Bank
ANEP	Agricultural Nontraditional Exports Promotion program/project (Uganda)
ANGAP	Association Nationale pour la Gestion des Aeres Protégés (Madagascar)
APE	Action Plan for the Environment (Uganda)
API	assessment of program impact
ASAP	Agricultural Sector Assistance Program (Malawi)
CAP	Commercial Agricultural Production project (Madagascar)
DFA	Development Fund for Africa
DLV	Department of Land Valuation (Malawi)
DREA	Department of Research and Environmental Assessment (Malawi)
EA	environmental assessment
EAP	environmental action plan
EIA	environmental impact assessment
EIR	environmental impact review
EIS	environmental information system
EM&E	environmental monitoring and evaluation
EMEMP	environmental monitoring, evaluation, and mitigation plan (or program) (Ghana, Uganda, and Madagascar)
EMP	environmental monitoring plan (or program) (Malawi)
EMSA	Environmental Monitoring Subactivity (of ASAP, Malawi)
EPADU	Export Policy Analysis and Development Unit (Uganda)
EPC	Environmental Protection Council (Ghana)
ESA	eastern and southern Africa
FAA	Foreign Assistance Act
GEAP	Ghana Environmental Action Plan
GERMP	Ghana Environmental Resources Management Program
GIS	geographic information system
GOG	Government of Ghana
GOM	Government of Malawi
GOU	Government of Uganda
GMU	Grants Management Unit (APE project, Uganda)
GRM	Government of the Republic of Madagascar
HIID	Harvard Institute for International Development
HPZ	high-potential zone
ICDP	integrated conservation and development project
IDEA	Investment in Developing Agricultural Exports (Uganda)
IEE	initial environmental examination
IRRI	International Rice Research Institute
ISF	Input Supply Fund (part of CAP, Madagascar)
KEPEM	Knowledge and Effective Policies for Environmental Management project (Madagascar)
LCF	Local Currency Fund (part of CAP, Madagascar)

LOP	life of project
MAELSP	Madagascar Agricultural Export Liberalization Support Project
M&E	monitoring and evaluation
MIX	Market Infrastructure Expansion project (Madagascar)
NARO	National Agricultural Research Organisation (Uganda)
NEAP	national environmental action plan
NEIC	National Environmental Information Centre (Uganda)
NEIS	national environmental information system
NPA	nonproject assistance
NRM	natural resources management
NTAE	nontraditional agricultural exports
ONE	Office National de l'Environnement (Madagascar)
PAAD	Program Assistance Approval Document
PEA	programmatic environmental assessment
PRISM	Program Performance Information for Strategic Management project
PSA	pesticide sector assessment
REDSO	Regional Economic Development Support Office (USAID)
REO	regional environmental officer (USAID)
RFP	request for proposals
SARSA	Sustainable Approach to Regional Income and Sustainable Resource Assistance Project
SAVEM	Sustainable Approaches for Viable Environmental Management project (Madagascar)
SD/PSGE	Office of Sustainable Development/Division of Productive Sector Growth and the Environment (USAID)
TFEA	tropical forestry environmental assessment
TIP	Trade and Investment Program (Ghana)
UNDP	United Nations Development Programme
WCA	west and central Africa
WRI	World Resources Institute

Executive Summary

Environmental monitoring, evaluation, and mitigation plans (EMEMPs) are a key element in USAID's strategy for identifying and protecting the environment in sub-Saharan Africa from harm caused by projects or policy reforms. Initiated as a response to regulatory requirements that USAID address such harm, EMEMPs now provide support for African governments' environmental information systems, research on sustainable agricultural practices, supplying data to mission-level monitoring systems, and other activities.

The development of an EMEMP is a process whose design and implementation parallels the design and implementation of the project it supports. This process usually includes the following specific components:

- analysis of the anticipated impacts of the project;
- analysis of what data will indicate whether those impacts are occurring;
- determination of baseline data needs;
- setting a time frame for monitoring; when it must begin, when impacts should be observable, for how long it must continue;
- identification of primary and secondary data sources;
- decision making about the source(s) of funding for the EMEMP;
- preparation of an implementation plan for data collection and processing;
- specification of how data are to be analyzed and by whom;
- anticipation of mitigation needs (what will be done if harm occurs, who will do it, who will pay for it);
- establishing links between the EMEMP and host government activities; and
- establishing links between the EMEMP and other USAID activities.

This report reviews EMEMPs in four countries: Ghana, Malawi, Uganda, and Madagascar. It is too soon to assess whether these EMEMPs are accomplishing their objectives because none have been in place long enough to observe this. Given this limitation, this report compares each EMEMP with the list of components above to see how or whether they have been addressed. It also evaluates the EMEMPs according to several other criteria. One criterion concerns whether EMEMPs are fostering institutional development in the host countries, through links to national environmental action plans (NEAPs), national environmental information systems, or other government activities. Another criterion concerns the links between EMEMPs and other USAID activities, including the project monitoring and evaluation (M&E) system, other environment projects, and the missions' program-level monitoring of the accomplishment of their objectives. A third criterion concerns how EMEMPs would function in a sustainable-development context, where project and program objectives are limited to *sustainable* income growth rather than including any growth in incomes.

In Ghana, the report examines USAID's Trade and Investment Program (TIP), an $80 million combined program and project designed to stimulate the production and marketing of nontraditional agricultural exports (NTAEs). This case is unusual in that design and

implementation of the EMEMP is the responsibility of the Ghanaian government and is a condition precedent for disbursement of TIP budgetary support. The director of the country's Environment Protection Council opted for this approach so the agency could use the EMEMP to begin implementing a number of systems developed through the NEAP.

Malawi's environmental monitoring program (an EMP, rather than an EMEMP) is linked to USAID's Agricultural Sector Assistance Program (ASAP), which is also a combined project and program supporting agricultural production and exports. The EMP has focused on one aspect of ASAP support provided for the production and marketing of burley tobacco. Through the EMP, USAID is providing technical assistance, equipment, and other support to strengthen the Government of Malawi's ability to monitor the environment and track change over time. This monitoring will not be specific enough to show the environmental consequences of increased production of burley tobacco, so the program also includes support for research that may be able to establish a clear causal link between the USAID program and the environment.

In Uganda, the EMEMP is linked to two projects: the Agricultural Nontraditional Export Promotion (ANEP) Project and the Investment in Development Agricultural Exports (IDEA) Project. A key issue in Uganda is the expectation that another mission project, the Action Program for the Environment (APE), which focuses on biodiversity and conservation, will provide environmental data to track certain impacts of the ANEP and IDEA. This approach seeks to build on complementarities across mission activities, thereby economizing on data collection. As in Malawi, Uganda's EMEMP also combines general monitoring of broad environmental change with support for research that may be able to show links between the project and the environment.

Madagascar's EMEMP will be designed through the Commercial Agricultural Promotion (CAP) Project, but it will track the impacts of two other projects as well, the Market Infrastructure Expansion (MIX) project and the Madagascar Agricultural Export Liberalization Support Project (MAELSP). USAID/Madagascar will implement the EMEMP through the CAP's contractor staff, relying in part on data provided by two USAID natural resources management (NRM) projects. This suggests an interesting model for mission-wide environmental monitoring, which could track the environmental impacts of all activities working towards a specific set of objectives, rather than being linked to individual projects.

Review of the four EMEMPs suggests a number of useful strategies for the future:

- The Bureau for Africa has adopted *sustainable* income growth as the objective of its mission-level programs. This should be extended to individual projects, and monitoring frameworks should be defined accordingly. At present, both project and mission staff often avoid environmental issues, regarding them as external constraints on their work. If they were judged not only on whether incomes rise, but also on whether those rises are environmentally sustainable, their attitude would change sharply to the benefit of the environment.

- The designers of EMEMPs should address explicitly whether or to what extent it is possible to show a causal relation between project activities and environmental change. Most of the EMEMPs are weak in this area. Although they usually note that it is necessary to show such a link, it is unclear how the data they propose to collect will do so.

- In some cases, it will be impossible to show such a causal relation. In this case, the government's priorities for the development of an environmental information system should be an important criterion in determining what the EMEMP will do; the monitoring of EMEMPs should not be limited to environmental concerns specifically related to the USAID project.

- Where it is possible to establish a causal relation, all recommendations for monitoring, choice of indicators, choice of baseline data, time frame for both baseline data and monitoring, and design of research activities should be justified clearly in terms of how they establish that link. Data collection that cannot be justified in those terms should be abandoned or justified in some other way.

- Given the difficulties in showing causality through monitoring, EMEMPs in a number of countries propose to fund research that may address this issue. This is an interesting strategy, but it is inadequately developed in the EMEMPs. The designers of EMEMPs and the Bureau for Africa's environmental staff should develop a research agenda focused on two major issues: (1) empirical investigation of the links between policy reform (particularly agricultural policy) and environmental change and (2) development of biologically sustainable agricultural practices. Where such research is integrated into an EMEMP, specific funding should be allocated for it, and the research questions and approach should be defined as fully as the monitoring systems now are.

- As USAID missions move towards funding at the strategic-objective rather than the project level, the designers of EMEMPs should investigate environmental monitoring at that level as well. Such an approach may emerge from the existing joint EMEMPs, such as those for the ANEP and IDEA in Uganda, or for the CAP, MIX, and MAELSP in Madagascar.

- Most EMEMPs call for extensive use of secondary data but do not evaluate what is available to see if they will meet USAID's needs. As the EMEMPs are implemented, data gaps are posing serious problems and requiring redesign that could have been avoided by better advance investigation. Consequently, anyone who designs an EMEMP and who anticipates the use of secondary data should contact the producers of those data to ensure they will meet USAID's needs.

- The designers of EMEMPs also envision use of data that other USAID projects provide without contacting the managers of those projects to see what they are doing and what kinds of data they can provide. The designers should instead work closely with NRM

project managers to assess the technical feasibility of sharing data. No assumptions should be made about the availability of data from other projects when the managers of those projects do not concur.

Chapter 1. Framework

A. The Genesis of EMEMPs

Environmental monitoring, evaluation, and mitigation plans (EMEMPs) are one part of USAID's strategy for identifying and protecting against environmental harm that might result from projects or policy reform in sub-Saharan Africa. This strategy has evolved substantially over the past twenty years and is still changing.

Prior to the 1990s, the single most important element of USAID's environmental protection activity in Africa was Section 216 of Part 22 of the Code of Federal Regulations (so-called Reg. 16), which describes the procedures through which USAID activities comply with the National Environmental Policy Act of 1970. Reg. 16 requires that a mission prepare an initial environmental examination (IEE), which makes a threshold determination as to whether a proposed project will have a significant impact on the environment. Projects deemed to have no impact receive a negative determination; those deemed to have significant impact receive a positive determination. Those for which it is not yet possible to determine the impact, usually because project subactivities will not be identified until implementation, may receive a deferred determination. Reg. 16 defines categories of activities considered unlikely to have any impact, which are exempted from the IEE. Examples of such categorical exclusions include research, technical assistance, training, workshops and meetings, and maternal and child feeding. Other categories of activities are expected always to have significant impacts; these must receive a positive determination. Some examples of these are drainage, river basin development, road building or improvement, and water and sewer projects. When a project receives a positive determination, an environmental assessment is conducted. It analyzes the anticipated impacts on the environment and recommends measures to prevent or mitigate them.

In 1987, Congress created the Development Fund for Africa (DFA), which provides the Bureau for Africa increased flexibility and money to fund nonproject assistance (NPA) as policy reform programs. The terms of the DFA place considerable importance on NRM and sustainable resource use, with 10 percent of DFA funds earmarked for that purpose. The Bureau's NPA guidance, issued after creation of the DFA, judged that the Reg. 16 IEEs are required for all DFA-supported NPA (USAID 1992). However, Section 496(h)(2)(B) of the Foreign Assistance Act (FAA), as amended in 1991, specifies that "policy reforms shall also include provisions to protect...long-term environmental interests from negative consequences of the reforms." This requirement to difficult to meet because the identification of long-term environmental consequences of policy reforms is problematic (Hecht, Christophersen, and Ganguli 1991; Rock et al. 1992; Rock and O'Keefe 1994).

The first EMEMP, that of the Trade and Investment Program (TIP) in Ghana, was designed in 1992 as a way to respond to the long-term environmental concerns raised by Reg. 16 and the DFA. Other countries quickly followed, with the EMEMP frequently a condition for awarding a negative determination to NPA policy-reform activities. The IEE usually leads to one of five conclusions, two of which require development of an EMEMP:

1. It may find no likelihood of environmental harm or a categorical exclusion, receive a negative determination, and the project would proceed as designed.

2. It may predict significant environmental harm, and the project would be modified or canceled. Such projects would receive a positive determination, and an environmental assessment would be required. This rarely occurs because such projects are not often proposed.

3. It may predict environmental harm and call for the project's redesign to prevent that harm.[1] This is the ideal approach to environmental protection since it is likely the most sound environmentally and the most efficient economically.

4. It may predict environmental harm but consider that harm justified by the benefits of the project and mitigable through other actions integrated into the project. This logic is most commonly observed in the "no net loss" standards applied to wetlands in the United States, through which developers may be required to create new wetlands to replace those destroyed by a project otherwise considered justifiable. This approach has not been followed in any of the EMEMPs but is foreseeable in the future.

5. It may anticipate possible harms but be unable to identify them specifically because major activities will not be defined prior to project implementation. This is particularly the case when government activities are to be funded with local currency provided through NPA. In such a case, monitoring may be required to ensure that, if harm does occur over the long-term, it will be identified and changes made during project implementation.

The third and fifth cases most often lead to EMEMPs. The strategies proposed in the EMEMPs frequently involve monitoring the project's environmental impacts and designing strategies to prevent harm from occurring. Less emphasis is on mitigation planned from the start of the project. In some cases, this is because stating explicitly that the harm caused is justified by its benefits may be politically difficult and therefore avoided. In other instances, it is because it is impossible to determine at the start the form that harm might take.

B. Can EMEMPs be defined?

There is no legal or regulatory basis for EMEMPs, so they are not defined in any rigid fashion. This has led to considerable fluidity, if not some puzzlement, as they have been introduced across Africa. In addition to addressing the relatively narrow legal concerns raised by Reg. 16 and the DFA, EMEMPs are being designed to serve a number of other purposes. Some respond to other legal requirements, including Section 533(c)(3) of the Foreign Operations,

[1] In much of the EMEMP literature this strategy is referred to as "mitigation." However, this makes it possible to confuse after-the-fact correction or clean-up of environmental damage--mitigation in the narrow sense of the word--with not allowing initial harm to occur. In this document, therefore, strategies to prevent harm from occurring are described as "prevention" or "avoidance"; "mitigation" refers only to after-the-fact clean-up.

Export Financing, and Related Programs Appropriations Act of 1991 on tropical forestry, and Sections 118 and 119 of the FAA on tropical forestry and biodiversity. EMEMPs are linked to the NEAPs of some countries, particularly by providing support to government-led environmental information systems. They are being used to develop African governments' capacities to protect the environment. Some EMEMPS are integrated with data development ongoing in other USAID projects or are tied to mission-level monitoring systems. Thus, they are being used to further purposes other than compliance with Reg. 16 and Section 496.

This breadth of purposes has led to requests for a precise description of what an EMEMP is (see, for example, Knausenberger 1994, 3). This paper does not attempt such a description, nor does the author believe it appropriate to do so at this time. The EMEMPs now under development vary widely in their objectives, methodologies, and proposed activities. A single description that encompasses all this variation would be too broad to be useful. One that identifies certain elements as appropriate to an EMEMP and precludes others would be a prescription rather than description. Experience to date with the implementation of EMEMPs is too limited to warrant a uniform prescription for what the systems should include. Moreover, it is unclear whether such a prescription will ever be useful. This report argues that instead of prescribing what EMEMPS *should be*, it should identify and understand what they *are* and why they vary across countries. Armed with this understanding, future designers of EMEMPs can assess which approach is most appropriate to their country and propose the system that best responds to local needs.

This said, it *is* possible to identify a few elements common to all EMEMPs. These are essentially three:

- An EMEMP is implemented in response to a program or project that could cause some environmental harm, but that harm cannot be predicted clearly enough definitively to avoid it.
- Response to this possible harm includes monitoring to determine whether it actually occurs.
- If the monitoring shows harm to be occurring, some action will be taken to mitigate it and prevent it from happening in the future.

These three common elements are clearly not enough to constitute a precise definition of an EMEMP. In addition to them, each EMEMP includes many additional themes or activities, which are combined to meet the needs and objectives of the country and the USAID mission. The section below discusses the fuller range elements that comprise the EMEMPs, to develop a framework for reviewing the experience in the four countries selected for this study.

C. What are the components of an EMEMP?

An EMEMP should be regarded as a process through which a plan for monitoring,

evaluating, and mitigating is developed and implemented. This process normally begins with the preparation of the EMEMP document itself, usually a single report referred to as "the EMEMP" or "the EMEMP document." This document does not include all the elements that will eventually be encompassed by environmental monitoring, evaluation, and mitigation but starts a process of discussion and refinement through which a system will be designed and put in place over time. Review of EMEMPs, therefore, must be based on broad consideration of all the related activities and discussion with the people involved, rather than on the EMEMP document alone.

It is worth noting that an EMEMP is typically distinct from three other related activities, the project or program monitoring and evaluation (M&E) system and its midterm and final evaluations. The M&E system is analogous to the EMEMP but targeted at the direct objectives of the project, not its incidental environmental impacts. In some cases the M&E system and the EMEMP are linked closely or even integrated, but the point of departure is that they seek to answer different impact questions. The midterm and final evaluations use external teams to assess how a project is being implemented and whether it is accomplishing its goals. Such teams can review implementation of the EMEMP as one aspect of project implementation. Unless *environmentally sound* development is an explicit objective of the project, however, they are not likely to devote much attention to the findings of the EMEMP.

The development of an EMEMP thus involves a chain of activities, only some of which the initial EMEMP document considers. This chain will usually include most of the following:

- Analysis of the anticipated environmental impacts of the policy reform, program, or project. If the program includes NPA budgetary support to the host government, does the EMEMP address its impacts on the environment as well?

- Analysis of what must be monitored to determine whether those impacts are occurring. This should be specific, if not at first, then later. It should address what each indicator is supposed to measure, which proxies will suffice if the actual thing in which we are interested cannot be measured, where measurement should take place, and why. This analysis should also address explicitly the issue of how or to what extent the suggested analytical approach will make it possible to establish a causal or correlative relation between the program in question and any observed environmental degradation. Where NPA budgetary support is included, will the EMEMP monitor its impacts, and if so, how?

- Discussion of baseline data needed and how they will be used. In the EMEMP context the term "baseline data" is used to refer both to background research with which to identify variables for monitoring and to first-year or historical data used to compare with the after-the-project state; it should be clear which is meant in any discussion of this issue.

- Time frame for monitoring; at what point can we expect the project to have visible

impacts on its objectives or on the environment, how does this relate to the life of project (LOP), and, in light of that, what is the time frame for monitoring? How does the time frame affect the EMEMP's design? If desired monitoring extends beyond the LOP, how will this be managed and financed?

- Consideration of the implications for funding and allocating resources to support the EMEMP. These implications involve potential sources of funding and decisions within missions about the programming of available resources.

- From where are the data expected to come? It is desirable to rely as much as possible on secondary data sources, from the host government, other projects, or other donors. Public data are weak in most African countries, however, and often the detailed data that other projects collect will not be applicable to the EMEMP's particular analytical needs, especially if we hope to show a causal link between the program and observed environmental harm. Therefore, some primary data collection may be needed to implement an EMEMP. This can expensive, so such collection must be included in the project or program budget to ensure that necessary funds will be available and that monitoring for the EMEMP is not sacrificed for lack of funds in the midst of a project. The EMEMP process should address data needs as early as possible and should confirm the availability of secondary data rather than assuming that they will be adequate so that funds can be reserved for primary data collection as needed.

- Determination of how the EMEMP is to be implemented; in particular, this must include a budget and clear identification of the source of funds. Implementation plans must also specify who is responsible for managing the process, analyzing the data, and so on. What will be the roles of USAID staff, project contractors, short-term technical assistants brought in by the mission or the project, regional or Washington-based USAID staff, government agencies, and others?

- Specification of how the EMEMP's data are to be analyzed and by whom; who will determine whether the project is causing unexpected or unacceptable environmental harm that requires mitigation? What harm will require mitigation?

- Anticipated mitigation; if harm occurs, what actions will be needed to mitigate it? Who will be responsible for implementing or paying for those actions? While we may hope to avoid mitigation with adequate prevention activities, it is important to anticipate insofar as possible what could be involved and its cost.

- Plans for how the EMEMP is to be linked to other environmental activities in the host government; such activities might include a NEAP, the creation of an environmental information system, or the development of an environmental review requirement and process. Presumably the EMEMP should build on existing processes or support nascent ones insofar as possible; how is this to be done?

- Consideration of the links between the EMEMP and other USAID activities, particularly the M&E plan for the EMEMP project, related USAID projects, and the mission's strategic monitoring system.

D. What criteria should be used to evaluate EMEMPs?

1. Achieving an EMEMP's purposes

An EMEMP's purpose is to protect against environmental harm that can be caused by the project or program with which it is associated. Ideally, EMEMPs should be evaluated on whether they accomplish that goal, but this is not yet possible. Most EMEMPs are still in the planning stages, so it is too early to know what their findings will be or how they will be used. Therefore, the criteria for evaluation must focus on the processes of designing and implementing and an EMEMP's objectives.

2. Operational criteria

EMEMPs can be evaluated based on whether they are designed and implemented effectively. Such evaluation could ask:

- does the plan include the key elements discussed above? Is it analytically strong and logistically feasible?
- is monitoring working smoothly, without administrative or managerial bottlenecks?
- are the data being analyzed thoroughly?
- are the data available to other interested organizations, projects, or donors?
- if warranted by the analysis, is the project or program being modified to mitigate or prevent further environmental harm?

Most EMEMPs are still in the design stage or have only recently begun monitoring, so it is too soon to address most of these issues. Nonetheless, we can consider how EMEMPs are being designed and assess whether this bodes well for effectiveness in meeting purposes for which EMEMPs are intended.

3. Institutional development in the host government

EMEMPs can be tied closely to host government activities. Consequently, they can provide a mechanism both to build monitoring and analysis capacity in the government and to offer financial support to ongoing government monitoring and analysis activities. Unlike the direct objectives of an EMEMP mentioned above, the extent to which such institutional strengthening is a desired outcome of activities related to EMEMPs will vary depending on the

country's capacity and interests. For example, countries that have a strong NEAP and are committed to establishing an environmental review process may want substantial responsibility for the implementation of an EMEMP so they can use it to strengthen their own systems. The EMEMP would then rely heavily on government agencies to supply and analyze the data. Similarly, where USAID is providing NPA budgetary support whose uses it cannot even identify, building the government's capacity to track environmental impacts of its own activities at least offers the hope that someone will identify or protect against unintentional harm.

In contrast, countries facing severe political and military problems may place little importance on the environment, and it may be more efficient and appropriate for USAID to limit the EMEMP to meeting U.S. regulatory requirements. Moreover, even when capacity-building is desired, there are always tradeoffs to be made between getting a job done quickly and training people to implement that job in the future; each mission must make an assessment of the importance of each goal. EMEMPs can thus be reviewed from the perspective of how they relate to ongoing government activities and provide support for capacity building, but no one strategy will be right *a priori*.

4. Links between EMEMPs and USAID mission activities

A fourth criterion for evaluation concerns the link between an EMEMP and other USAID activities. USAID activities that might be linked to an EMEMP are often of four types: the M&E system of the project or program for which an EMEMP is required, the environmental monitoring systems for similar USAID projects, the M&E systems for mission environment or NRM projects, and the mission's API reporting system. Linking an EMEMP to environmental monitoring systems of similar projects (the second option) is straightforward. A single system can generally be designed to track several sets of activities if it is established before any of the projects begins. This provides an opportunity to share the cost and minimize the burden on each project.

Links between an EMEMP and a project's M&E system are more complex. To the extent that a project's or program's direct objectives are defined in terms of *environmentally sustainable* increases in income, agricultural production, etc., there will be considerable overlap between a project's M&E systems and environmental monitoring and evaluation (EM&E). Where environment is a separate constraint, however, rather than a direct objective, the systems may be separable.

An EM&E system can also depend on M&E data. In many projects the environmental impacts depend on first accomplishing the project's direct objectives. For example, many (although certainly not all) environmental harms caused by agricultural export projects result from increased production. Thus the first step in the EM&E system will be to observe whether the project's direct objective of increased production is accomplished. This information should come directly from the M&E system.

The use of data from an EMEMP in API monitoring systems will depend on the

importance of sustainability in mission objectives. If environmentally sustainable development is one of the mission's strategic objectives, the API will have to demonstrate environmental soundness, and EMEMP data will be useful for mission-level monitoring. If not, the EMEMP considerations may not be relevant to the API. This is readily observed in the indicator frameworks that missions develop with assistance from the Program Performance Information for Strategic Management (PRISM) Project. PRISM teams have worked with many USAID missions to help them clarify their goals, strategic objectives, and subobjectives, and then to identify indicators with which mission performance can be measured. In the hierarchy of targets defined through these monitoring systems, goals are the highest. Performance monitoring is done at the project, subobjective, and strategic-objective levels, but not at the goal level, since goals are often too abstract to be able to show a clear link to USAID-funded activities. The resulting documents, referred to as the "PRISM reports," are used for regular API monitoring. They provide a clear picture of a mission's goals and objectives and of how an EMEMP or other environmental data are integrated into the evaluation of a mission's program.

Finally, the feasibility of linking EMEMPs to other NRM projects will depend on the design of the projects involved. In particular, this could be effective when they work in the same geographic regions or address the same environmental problems. Where they differ in such important respects, it may be impossible to link EMEMPs to other NRM projects.

5. The sustainability issue

A fundamental question in all discussions of EMEMPs focuses on whether environmental concerns are an incidental constraint on the ability to meet primary objectives or a direct objective of the project itself. The former is the "traditional" view of the environment. Using a linear programming metaphor, in that framework agricultural exports or other project outputs are to be maximized subject to certain constraints on permissible environmental harm. The latter is the sustainable-development view of the environment. Increases in output constitute development only if they are sustainable; thus environmentally damaging increases in exports would not be a successful project outcome. Which of these views is followed will have important implications for how the project will view environmental monitoring and mitigation. The concept of sustainable development is fundamental to the DFA as a whole, but this approach has not yet been integrated fully into the design of all projects and programs. How this evolves in practice is, therefore, another element that should be considered in examining individual EMEMPs.

E. Overview of this report

The next chapter describes the EMEMPs in four countries--Ghana, Malawi, Uganda, and Madagascar--considering how they address the issues raised in this introduction. Chapter 3 discusses broader issues about EMEMPs, identifying common problems and issues that are likely to arise in these countries or elsewhere in the future. It recommends a number of strategies that may be helpful in strengthening the inclusion of environmental concerns into USAID's projects, both through the initial project design and through EMEMPs.

Chapter 2. EMEMP Descriptions

This section provides an overview of the design and implementation of EMEMPs in four countries. Since EMEMPs are so new, most emphasis is on design and planning considerations rather than on implementation. The information presented here is intended to shed light on the issues raised in the previous chapter, with less attention to technical data that, although important, do not address those questions. For example, it is important to note *whether* environmental impacts of an EMEMP project have been assessed, but the detailed *content* of that assessment is not important here. This chapter discusses other projects or programs--whether funded by USAID or by other donors--insofar as they are directly related to the EMEMP: providing data to the EMEMP, being monitored jointly, or receiving EMEMP support for data collection. This is not an overview of major environmental activities in the countries involved, so it does not address projects or programs not linked to the EMEMP.

A. Ghana

1. Ghana's Trade and Investment Program (TIP)

Ghana's EMEMP addresses the possible environmental impacts of the Trade and Investment Program (TIP). TIP is an $80 million combined program and project designed to stimulate the production and marketing of nontraditional agricultural exports (NTAEs). It includes cash grants, local currency funding, and project-funded technical assistance, conditioned in part on the willingness of government to undertake regulatory reforms that will reduce the transaction costs of exporting. Institutional support and technical assistance are going to the Ghana Export Promotion Council, the Ghana Investments Center, the Ministry of Trade and Tourism, medium and large-scale agricultural producers and exporters, trade associations, and others involved primarily in marketing and exporting agricultural produce. The program does not target directly the Ministry of Agriculture or the Ministry of Environment, either of which might play a role in ensuring that strategies for increasing agricultural output will be sustainable and environmentally sound. As discussed below, the program does give responsibility for implementation of the EMEMP to the Environmental Protection Council (EPC), which is within the Ministry of Environment.

TIP might affect the environment in a number of ways, described in the Environmental Impact Review (Thrupp et al. 1992) and in the EMEMP document itself (Dorm-Adzobu and Samba 1992). The project focuses on four resource-based sectors of the economy: salt, shrimps and prawns, forest-based industry (furniture), and nontraditional agricultural products (primarily pineapple). The salt industry involves mining and evaporation in coastal and riverine lagoons and can lead to imbalances in lagoon ecosystems and consequent harm to migratory birds. The major concern in the shrimp and prawn industry is overharvesting. Forest-based activities can involve nonsustainable rates of harvesting, devegetation, and consequent problems with erosion and fertility. Pineapple production, which occurs mainly in the Densu River Basin near Accra, can cause both significant devegetation and pollution from agrichemicals.

2. Ghana Environmental Resource Management Program (GERMP)

The GERMP is a World Bank-organized and multidonor-funded program to implement the Ghana Environmental Action Plan (GEAP). The plan was developed over a three-year period through examination of sectoral and cross-sectoral environmental issues and consideration of policy, legislative, regulatory, and project-based approaches to address them. The GERMP has three major components. The land and water management component is the responsibility of the crop services division of the Ministry of Agriculture. The coastal wetlands component, which includes biodiversity and conservation of migratory bird habitat, is the responsibility of the game and wildlife department of the Ministry of Environment. The environmental resource management component, which includes cross-cutting activities in the areas of environmental information, institutional capacity building, and public education, is under the EPC's jurisdiction, which has established four intersectoral institutional networks to address specific issues of concern. The EPC is also the conduit for all GERMP funding, including that provided to support the two program components not specifically under its control. USAID has not played a key role in developing the GEAP or funding its implementation.

One of the four networks being developed under the EPC's component of the GERMP is the National Environmental Information System (NEIS), which is designed to address information needs for environmental management. Existing sectoral agencies and research groups that collect data routinely will be integrated into this network. Data collection will continue to be their responsibility, but the EPC expects to build a general-purpose database of secondary data on the environment that will be readily accessible and usable. The EPC's database will not replace any existing data collection; rather, it will provide a centralized source of information, facilitating the use of data by government, donor agencies, and the public. The GERMP will also fund the collection of some new data, particularly the preparation of land-use and land-cover maps by the University of Ghana's remote sensing unit. The EPC's computer system is not yet in place, so it will be some time before its database is accessible to would-be users.

3. General description of the EMEMP for the TIP

The TIP went through a series of environmental reviews during its development. The initial environmental examination (IEE) was prepared in early 1992 by the then-head of the EPC, Clement Dorm-Adzobu. That it was prepared by a Ghanaian instead of an American is unusual and was clearly a key factor leading to the strategy that this EMEMP follows. The IEE recommended a categorical exclusion for the program's technical assistance and institutional strengthening portions. Since meeting the program's objectives involves increased production, the IEE indicated a need for environmental impact reviews (EIRs) in the four areas of project focus: salt mining, fisheries, forestry, and nontraditional agricultural exports. To comply with Section 533(c)(3) of the Foreign Operations, Export Financing, and Related Programs Appropriations Act of 1991, the IEE also called for preparation of a Tropical Forestry Environmental Assessment (TFEA), which would consider the sustainability of any forest-based activities supported under the TIP. Finally, the IEE notes the need for an EMEMP to ensure

that the project will be tracked and that midcourse corrections will be in place to protect the environment should the need arise. With these conditions, the TIP's policy reform components were given a negative determination, in accordance with the provisions of Reg. 16.

A group of Ghanaian and expatriate scientists completed the four EIRS and TFEA in 1992. The EMEMP document was also prepared then, authored by Dorm-Adzobu and USAID's regional environmental advisor, Idrissa Samba (Dorm-Adzobu and Samba 1992). This document lists general indicators that could be used to track both the project's legislative and the NTAE components and identifies government institutions that can be responsible for each area of activity. These lists are comprehensive. The document recognizes the need to limit them and suggests some criteria for doing so but does not indicate which of all the data mentioned should actually be collected. It does address a number of implementation issues, including the costs of each component of the monitoring, recommended approaches to data management, and the need to continue monitoring beyond the duration of the USAID project.

4. Identifying anticipated possible impacts on the environment

The anticipated impacts on the environment are reviewed thoroughly in the four environmental reviews prepared for the TIP. These are summarized in general terms in the EMEMP document itself and serve as the basis for the proposed monitoring.

5. Allocation of responsibility

The implementation of the EMEMP for the Trade and Investment Program is the EPC's direct responsibility and is intended to be entirely out of the hands of USAID or the TIP's staff. Implementation of the EMEMP is part of the host country's contribution to the TIP program and is a condition precedent for disbursement of the TIP's funds. The EPC, as the coordinating body for implementation of the EMEMP, is contracting with several other Ghanaian institutions for data collection and analysis in the areas of water quality, soils, water levels, vegetative cover, and minerals. The EPC expects to analyze the data and work with the Ministry of Trade on midcourse corrections if the project is found to be harmful to the environment.

This allocation of responsibility for the EMEMP reflects Ghanaian officials' conviction that there is a high-level commitment to the environment within the government as well as their interest in using this activity to test procedures for environmental protection that have not yet been applied. When the TIP was planned and the environmental review documents written, the EPC was an independent agency under the authority of the prime minister's office. The Council had the authority to require line ministries to change their activities in order to protect the environment, but that authority had never been used. The EPC's director was interested in using the TIP to test that system. He thus played an active role in writing the environmental documents and was eager to see responsibility for the TIP's implementation given to the EPC. Since then, a Ministry of Environment was created and the EPC placed within it, and the EPC's previous director has resigned. The EMEMP's implementation was stalled for over a year, partly as a result of these changes and partly because of unrelated funding bottlenecks, but the

new director is equally interested in his agency having responsibility for the EMEMP.

From USAID's perspective, placing responsibility for the EMEMP's implementation in government hands is a mixed blessing. On the one hand, the Ghana model should be USAID's ideal. Presumably the long-run goal is for all African governments to accept this level of responsibility for internalizing environmental monitoring and mitigation. On the other hand, this allocation of responsibility has meant that USAID/Ghana could not (or would not) intervene when the EPC did not fulfill its responsibilities in a timely fashion. From the mission's perspective, waiting for the government to act is appropriate, and the conditionality is seen as providing sufficient leverage to ensure that the EMEMP will be implemented eventually. From an outside perspective, this has not been as clear. There has been an impression that the mission does not want to deal with the EMEMP rather than that it wants to avoid intervening and taking responsibility from the government. Thus, when USAID/Washington and World Resources Institute (WRI) offered to provide technical assistance to operationalize the EMEMP, the mission declined, in a move that made sense from the field but perhaps not in Washington.

The fact that the EPC wants ownership of the EMEMP does not mean that all the institutions involved believe the same way about it. For the contractors doing the monitoring, this seems to be "just a job." The water quality monitoring, the responsibility of the Institute of Aquatic Biology and the Water Resources Research Institute, is farther along than any of the other elements. Work has recently begun on selecting the sites where monitoring will occur, though data collection has yet to start. Both agencies characterize the EMEMP work as small contract assignments in the context of a work program that includes both contracts and activities that fall more closely into a research agenda of their own design. As long as funding is available the contractors will continue to do the monitoring, but they do not see it as something they will continue with their own resources when external funds are depleted. This suggests that if USAID hopes to monitor the TIP's impacts past the life of project, it will have to find a mechanism to continue providing funding in the future.

6. Funding for preparation and implementation

Along with its responsibility for designing the EMEMP, the Government of Ghana (GOG) is also responsible for monitoring and any subsequent mitigation that may be required. The TIP's project component is providing $50,000 for equipment that must be purchased in dollars, but all the EMEMP's other costs are to come from the government. In fact, the TIP is making substantial resources available to the GOG through its NPA component, so in a sense this can be seen as coming from U.S. resources. These resources are not directly allocated to the EMEMP, however, so the EPC perceives this contribution as coming from its regular budget. Each of the contractor agencies conducting monitoring for the EMEMP presented a budget to the EPC for its expenses. Delays in allocating the necessary resources to the EPC were a major cause of the delay in beginning the monitoring; however, this apparently did not signal a general unwillingness to undertake the work but only routine bureaucratic problems.

7. Specification of data to be collected, baselines, and establishing causality

The documents available for this study--the IEE, the environmental reviews, and the EMEMP document itself--provide general descriptions of the types of data needed to track the TIP's environmental impacts. The EMEMP document also identifies organizations already collecting data of each type, planned work in each area, and areas in which additional data collection is recommended under the TIP. The indicators identified for monitoring are sufficiently specific to give guidance to technical institutions designing monitoring plans, but they are not precise enough to tell the reader which data are already available, which are to be collected, how they will be collected, or where they can be obtained.

For example, for nontraditional exports, the EMEMP document calls for annual monitoring of new land-use patterns, deforestation, natural versus cultivated areas, changes in vegetation, and cropping and fallow patterns. The Survey Department, which the GERMP is equipping to do remote sensing and mapping, is expected to provide these data. Despite this assignment of responsibility, there is no precise information about what the GERMP is funding at the Survey Department, the scales at which the department will work, the legends to be used in maps routinely produced, when the information will be available, and so on. Answers to these questions are necessary in order to determine whether the Survey Department's data will actually meet the TIP's needs for specific large-scale data on land use. Similar issues arise with respect to most other institutions expected to provide information for the TIP's environmental monitoring. In general, it is important to remember that just because one agency has--or will have--data on a given topic does not mean that these data will meet another agency's needs for information on that topic. There is probably some flexibility in the information that could meet the TIP's EMEMP-related needs, but until the *precise* specifications of data being collected by other agencies are known, we cannot determine whether the TIP can use them. Neither the EMEMP document nor subsequent documents does this.

The EMEMP document is also insufficiently explicit about what is meant by collecting baseline data on environmental quality. It calls for collection of "geographic and thematic documents," "single theme maps," and "documents, studies, census, surveys of all nature on the project area," but it is not clear either about who can provide these data or about what specific information will be useful for comparison with the post-TIP situation (Dorm-Adzobu and Samba 1992, 45).

The EMEMP document is also not specific about how to show a causal link between the TIP's activities and observed environmental degradation. The document does raise the issue, citing the need for a description of the causes of degradation--specifically, "(a) how much the change is a function of project goals; and (b) is the change really related to project activities or is it [due to...] natural variation" (Dorm-Adzobu and Samba 1992, 47). The document does not analyze how these questions can be answered. It is reasonable to leave that to the researchers to determine; it might be desirable, however, for some planning document to consider *in advance* what significance would be attached to different results and what information (e.g., monitoring results, less formal discussion with local populations) would be used to assess the

causes of degradation.

8. Timing of EMEMP monitoring

The TIP's environmental monitoring is now scheduled through 1997, when the project ends. The EPC's staff expect this will be extended through 1998 by piggy-backing onto GERMP funds available for similar data collection in the same regions of the country. After that, the staff have no idea what will happen. The EPC is well aware that the impacts of the TIP's activities might not be evident until after 1998, but do not have means at their disposal now to plan for further monitoring.

9. Evaluation

The EMEMP's evaluation component involves analysis of the monitoring data to determine whether environmental degradation is occurring. The institutions contracted for data collection and possibly the EPC will do this analysis. The EMEMP document calls for timely statistical analysis of the data but leaves specification of precise types of analysis to the technical institutions involved. The data are also to be made available to other interested organizations, including educational institutions, private entrepreneurs, nongovernmental organizations (NGOs), and donor agencies. This means, at least in principle, that the public will have the information necessary to dispute the EPC's analytical conclusions if desired.

Assessment of the EMEMP data is not expected to be part of the TIP's midterm or final evaluations. USAID staff responsible for the TIP expect evaluation teams to assess whether the monitoring has been conducted in order to determine whether conditions precedent were met, but not to consider the TIP's environmental impacts.

10. Mitigation, Prevention, and Environmental Assessment

The mitigation of environmental degradation caused by the TIP's activities is the host government's responsibility. The IEE and the EMEMP document note the need for feedback mechanisms so that if the EPC detects environmental harm through monitoring, it will call upon the Ministry of Trade to make midcourse corrections in the TIP's activities to correct the situation. The documents allude to draft environmental impact assessment guidelines available from EPC but do not treat them as a part of the mitigation plan.

The EPC's leaders believe they have sufficient authority to request the Ministry of Trade to modify the TIP's activities should this be necessary. Although the Ministry of Agriculture is not involved with the TIP, the EPC's staff also believe that if the mitigation requires extension work in environmentally sound agricultural practices, there is enough high-level government support for environmental protection that the necessary resources will be provided to the extension services. USAID/Ghana staff corroborated this view. They believe that the government is sufficiently committed to environmental protection that this approach can be viable. According to USAID, the Ministry of Trade official responsible for the TIP is also

concerned about the environment and so is likely to support any requests from the EPC for midcourse corrections.

Thus the TIP's approach to mitigation, like its approach to responsibility for environmental monitoring, relies on the kind of government interest we would hope to see in all African countries. For this reason, although we might be unsure whether it will be effective, we must applaud the Ghanaian enthusiasm. There is a key difference, however, between this system and an equivalent one in the United States. Whereas the United States would look to legal safeguards and public oversight to ensure that such a system works, both Ghanaian officials and USAID staff are frank about this system depending on the personal support of key individuals in the government. This may reflect a realistic understanding of what is likely to work in the Ghanaian context.

11. Links to a national EIS, a NEAP, and other government activities

The EMEMP's monitoring is to be linked to other environmental monitoring in two ways. First, the EMEMP document anticipates heavy reliance on data that other government agencies collect through the GERMP and other projects. As discussed above, however, the TIP documents do not look closely enough at other data sources to determine whether this will be feasible. The principle makes sense, but it is not clear that it will work. Second, the data collected specifically for the TIP monitoring are to be integrated into the environmental information system being created through the GERMP under the EPC's jurisdiction. This will not mean, however, that the information priorities set in the NEIS design will influence the choice of data to collect under the TIP, only that the data will be stored as part of the system and will be available to government agencies, donors, and the public through the EPC.

The several years of work that went into Ghana's NEAP probably also had a fundamental, albeit indirect, impact on the EMEMP for the TIP. That planning process may likely be credited with government agencies taking ownership of the country's environmental problems and thus taking responsibility for the EMEMP's implementation. Of course, without a careful study of the NEAP process, we cannot be sure of this; it could be that some other force within the Ghanaian government led both to the thorough and participatory NEAP and to the desire to take control of the EMEMP. Therefore, we cannot assume that NEAPs will necessarily be associated with public ownership of environmental problems in other countries. In this case, however, there does appear to be a link.

12. Links to other USAID projects or monitoring

The 1994 review of the EMEMP's implementation in Ghana describes the EMEMP as "part and parcel of the overall USAID/Ghana mission monitoring and evaluation system" (Amekor and Samba 1994, 2). Discussion with USAID's M&E and TIP staff suggest, however, that they do not see any link between the EMEMP and any of their other M&E systems. The TIP's M&E plan does not discuss environmental impacts, focusing only on the impacts of the TIP's activities on their direct objectives. As mentioned above, USAID staff responsible for the

TIP do not expect external evaluation teams to examine the EMEMP beyond ensuring that the conditions precedent have been met. The PRISM report on Ghana does refer to "sustainable" development at the goal level. According to Mission staff this means financially sustainable, not environmentally sustainable. Moreover, sustainability is not part of the mission's strategic objectives or subobjectives, which refer only to increases in incomes from agricultural production. Thus the performance monitoring system does not track sustainability, and none of the indicators proposed for inclusion in the API have any bearing on the environment. Given that environment is not part of the mission's strategic objectives, this is to be expected; mission staff do not perceive the EMEMP's results to be relevant to the objectives either of the TIP or to the mission's current development program.

B. Malawi

1. Agricultural Sector Assistance Program (ASAP)

The ASAP is an agricultural policy-reform program that provides the Government of Malawi (GOM) with $20 million in budgetary support and $15 million in complementary project funding. The program has focused initially on the production and marketing of burley tobacco. In particular, the ASAP calls for freeing the rights to cultivate and market the tobacco in order to level the playing field between smallholders and estate owners in this lucrative export market. Prior to the ASAP, only large landowners (estates) had a legal right to produce tobacco while small family farms produced food and other cash crops. Returns to tobacco production were estimated at eight to nine times those of maize, and 24 to 30 times those of cotton, so some smallholders were establishing themselves as estates in order to have the right to produce burley tobacco instead of other crops (ASAP Midterm Evaluation n.d., 2). This option was available to the largest smallholders but not to smaller and poorer ones.

The ASAP, together with the World Bank's Agricultural Sector Adjustment Credit program, recommended that the government increase the quota for burley production and allocate some of that quota to smallholders. The ASAP's project component is providing complementary technical support to smallholder burley growers to help them produce and market their crop. Subsequent elements of the project are to provide broader help to small producers, through access to credit, agricultural inputs, output markets, labor market information, and alternate cash crops.

2. The NEAP and the EIS

Malawi has just completed preparation of a NEAP, which recommends sizable investments in environmental information systems. The ASAP's environmental monitoring program (EMP) will serve as a point of departure for developing these systems. Beyond this support, USAID expects to provide additional assistance through ASAP II (now in the design phase) to allow the Department of Research and Environmental Assessment (DREA) to expand its institutional capabilities now being developed through the EMP to address a broader range of environmental information needs. This is being included in the investment planned in the

NEAP; the IEE for it is now under preparation. This does not bear directly on how the EMP is to be implemented at this time, but it does allow for optimism about the ability to institutionalize work related to the EMP in the future.

3. General description of the EMP

The ASAP's IEE focuses on Malawi's general situation of high population density, deforestation, cultivation on steep slopes, and consequent soil erosion. These problems are not due to solely to the production of burley tobacco, so trying to establish the direct impacts of the ASAP's activities on the environment will be difficult.

The IEE declares the need for activities both to mitigate and to monitor this general degradation.[2] On the mitigation side, the IEE calls on the GOM to streamline the activities of the Estate Management Division of the Department of Land Valuation (DLV) and concentrate labor and other resources on sound land-husbandry practices. In addition, the ASAP's project component is to provide support for extension work in agroforestry and soil conservation. In the monitoring area, the IEE supports the establishment of a land-use monitoring committee within the DLV to track land use in regions of burley production and relate it to changes in erosion, soil conditions, water quality, deforestation, and other environmental conditions.

The ASAP's conditions precedent place responsibility for environmental monitoring with the government, making the submission of an environmental monitoring plan (EMP) a prerequisite for release of the second tranche of funding. The DREA has overall responsibility for implementing this work, with technical assistance that USAID will provide to help the DREA design and implement the EMP system.

4. Identifying anticipated impacts on environment

The discussion of the impacts of burley production on the environment is limited to a few paragraphs in the IEE, repeated in most of the ASAP's other environmental documents. These paragraphs describe Malawi's general environmental degradation, which is linked to all agricultural activity, not specifically to burley tobacco. Burley production is already a major ongoing activity, so its environmental impacts are common knowledge, and further formal environmental assessment is apparently not warranted.[3]

5. Allocation of responsibility

The IEE and the conditions precedent establish the DREA as the agency responsible for

[2] This discussion is based on the version of the IEE available to the author; a revised IEE may now be available.

[3] This explanation for the lack of any more structured environmental assessment was provided in personal communication with Eric Loken, USAID's Regional Environmental Officer for East and Southern Africa.

preparing and implementing the environmental monitoring plan. That agency's initial efforts to prepare a plan met with USAID's criticism for its lack of rigor, inclusion of low-priority data collection, and inflated equipment budgets. To help the DREA revise its initial proposals, USAID provided a team from the World Resources Institute (WRI), the Office of Arid Lands Studies at the University of Arizona, USAID/Washington, and USAID's Regional Economic Development Support Office (REDSO) in Nairobi to work with the Malawians on a scope of work and workplan for the so-called Environmental Monitoring Subactivity of ASAP (EMSA). The DREA subsequently submitted a revised proposal to USAID, and it is the basis of the EMP activity. Thus, although the GOM's preparation of this plan was a condition precedent for ASAP funding, USAID provided substantial technical assistance to help in fulfilling it.

The team's monitoring program is "a distributed effort based on a clear division of labor and effective cooperation between the participants" (Brunner, Dworkin, and Hutchinson 1993). The DREA has direct responsibility for implementing the program, as its coordinator. Primary data collection will be the responsibility of six technical agencies, each receiving ASAP support to reinforce and, in some cases, extend work they already do. These include:

- the Department of Forestry, National Parks and Wildlife, for forest mapping and monitoring;
- the Department of Surveys, for topographical and parcel- boundary mapping;
- the Land Resources and Conservation Branch of the Ministry of Agriculture, for soil surveys, household surveys, and land-use enumeration;
- the Remote Sensing Unit of the Land Resources and Conservation Branch, for management and analysis of aerial photography and videography and technical support on geographic information systems (GIS) and remote sensing;
- the Department of Meteorology, for supply and analysis of weather data; and
- the Department of Water, for supply and analysis of water quality data.

The DREA is responsible for providing logistical support to these agencies, evaluating the information they provide, participating in a dialogue on their findings, and centralizing and publishing the results.

USAID is providing substantial technical assistance to these agencies. A full-time expatriate implementation advisor began working with the DREA in October 1993, helping to manage the project as a whole. In addition, the Office of Arid Lands Studies is providing assistance with aerial videos and remote sensing, the Systems Approach to Regional Income and Sustainable Resources Assistance (SARSA) Project led by Clark University is assisting with the introduction of GIS, the Natural Resources Information Consultative Group at WRI is working on information management and policy development, and the Harvard Institute for International Development (HIID) is helping to conduct household socioeconomic surveys.

The GOM's contribution to this effort includes counterpart support within the DREA and the organizations collecting the data. The government funds the DREA's staff with NPA-support funds. Initially, the DREA had hoped to hire seven additional staff members for this effort, but

this was subsequently reduced to three. There were delays in filling these positions, which have apparently been a constraint on the ability to begin work in early 1994 (Dworkin 1994, 2; Hutchinson and Hay 1994). As of April 1994, however, the positions had been advertised, and recruitment was in process, so the GOM should be equipped to work with the expatriate technical assistance teams shortly.

6. Funding for preparation and implementation

The GOM and USAID are sharing the costs for the EMP's preparation and implementation. The project component of ASAP itself has provided $1.3 million for the long-term technical advisor, equipment purchases, and support to the DREA and other GOM institutions. Its support is being provided through the University of Arizona and HIID. In addition, USAID/Washington core contracts with WRI and SARSA have provided additional support related to, if not directly a part of, the EMP. Due to the many different sources of U.S. government funding, some ambiguity exists as to which activities are strictly part of the EMP and which (e.g., Clark University's GIS activity) are part of related but distinct activities. The GOM's support is through its counterpart staff and overhead; estimates of the value of that contribution were not available for this study.

7. Specification of data to be collected, baselines, and establishing causality

The specification of data to be collected under the EMP has, reasonably, become more precise as the documents have been elaborated over the past two years. The early DREA plan specified five catchment basins for monitoring. In keeping with the rather general descriptions of the environmental impacts of burley tobacco in the EMP documents, the basins are to be monitored for changes in general land use, vegetation and land cover, soil erosion, water pollution, and other environmental characteristics.

The choice of the five basins has been the subject of some controversy. Early DREA documents indicate they were chosen because they are exemplary and because they are small, relatively accessible, and can be monitored efficiently. Their selection led to much discussion among USAID staff and technical advisors as to whether the data gathered on these five basins could be generalized to assess the impacts of burley production on the country as a whole. The Brunner, Dworkin, and Hutchinson (1993) report explicitly states that because the basins are exemplary rather than representative, it will not be possible to draw reliable conclusions at the national level. In its monitoring program document based on this report, the DREA changed the word from "exemplary" to "indicative" but still acknowledged that the basins are not representative. Loken (1993, 2) in his comments on an early draft of the Brunner report, however, argues for stronger linkages between catchment basin and national data, giving examples of how data from the catchment basins can be used to suggest national concerns about the environmental impacts of burley production. This implies that even if the five basins are not statistically representative, at least the direction of impact will be the same, so that a problem observed in the sample is likely to be a problem nationwide even if its magnitude cannot be estimated. This issue is not fully resolved in the documents, and controversy still exists about

whether the sample should be changed to make it representative.

The Brunner report (Brunner, Dworkin, and Hutchinson 1993) describes in general terms the kinds of information to be gathered in each basin and divides the work involved into discrete tasks, specifying who is to do each. It makes some references to relying on data other than those collected under the EMP, such as information from the Collaborative Study of Cassava in Africa, "village rosters" for the five catchments, and national agricultural statistics. There is no single EIS program on which the EMP expects to rely, but the documents do seem to assume that the EMP can build on some existing data and data-collecting institutions. As in other countries, however, there is no review of the precise contents of existing databases to determine whether or how well they will meet the ASAP's EMP-related needs. This lack of specificity is posing problems now; for example, the Arid Lands team found that maps expected to provide parcel boundaries did not, so team members had to revise their overall data collection and analysis methodology after work was supposed to have begun (Hutchinson and Hay).

The EMP's monitoring work is not expected to demonstrate a clear causal relation between burley production and environmental degradation. To address this concern, the EMP recommends a program of small research grants to fund investigation of issues directly related to the impacts of agricultural production on the environment, instead of trying to establish such linkages statistically through broader monitoring. The EMP documents cited the need for the EMSA contractor to assist USAID and the DREA in evaluating the grants but did not provide any details. Subsequently, these grants have been linked to a World Bank-funded National Agricultural Research Program within the DREA, which is developing detailed protocols for research proposals, funding rules, and expected outputs. The ASAP will contribute about $150,000 to this system in lieu of developing its own funding system.

8. Timing of monitoring for the EMP

The EMP documents do not address explicitly the question of how long the monitoring of the five catchment basins will continue. USAID funding, particularly for the implementation advisor, will continue through the end of this phase of the program, now anticipated for 1998. The implication seems to be that data collection will continue indefinitely, presumably with the government covering recurrent costs. This interpretation is consistent with USAID's significant investments in training, equipment, institutional development, and other start-up costs for this monitoring, both through the ASAP itself and through the related buy-ins to WRI and SARSA. The support for development of the NEIS, which is planned in the ASAP Phase II, may provide the additional funding needed to continue this monitoring.

9. Evaluation

The documents include little explicit discussion of the EMP's "evaluation" component. The Brunner, Dworkin, and Hutchinson (1993) report and the DREA plan give it primary responsibility for evaluating the information gathered through the monitoring effort. The report assumes that the technical agencies doing the collection and the program's coordinators will

evaluate the monitoring data. The ASAP's midterm evaluation did not address the EMP. This led WRI to suggest that in the project's second phase (i.e., ASAP II) that environmental monitoring be more closely integrated than it is now with the rest of the project and with the project's M&E system (Brunner and Veit 1993, 1).

10. Mitigation and Environmental Assessment

There is also little discussion of mitigation in the EMP documents. It may be telling, in this respect, that the DREA has produced an environmental *monitoring* plan, not an environmental *monitoring, evaluation, and mitigation* plan. Given that the routine monitoring is expected to show environmental degradation, but not necessarily to tie it closely to burley production, mitigation is likely to be equally general in nature and not tied specifically to one product. Neither the content of possible mitigation, nor who should implement it or pay for it, is discussed in the EMP documents, the trip reports, the monthly reports, or any other material available for this study.

USAID/Malawi's cable on implementation of the EMP (USAID/Malawi 1994) does mention an ASAP-funded agroforestry extension activity designed to increase output while decreasing environmental degradation. This is to be extended to address the specific needs of burley production and will eventually be implemented in the five catchment basins that the EMP is monitoring. This activity can be understood as a form of mitigation of the environmental harm that the ASAP might cause. Thus USAID will fund and implement the only mitigation activity currently under consideration to address the ASAP's impact on the environment. If these techniques are indeed effective, farmers should be willing to adopt them in the long run without special incentives, so an effort like that proposed in the cable could conceivably suffice to mitigate harm related to the ASAP. This remains to be seen.

11. Links to a national EIS or a NEAP

The EMP is not dependent on the NEAP or on the EIS proposed within the NEAP investment program. As discussed above, the EIS is to build on EMP monitoring, however, so the EMP will contribute to the development of a more sustainable environmental monitoring capacity in the country.

12. Links to other USAID projects or monitoring

The EMP has not yet been linked to other USAID projects or monitoring.[4] As already mentioned, there is no consideration of environmental monitoring in the ASAP's midterm evaluation. The EMP cable suggests that USAID/Malawi hopes to use the EMP's annual reports to obtain indicators for the next API report. The 1993 API report does not include any objectives or indicators related to environmental protection, so this would reflect a shift in the

[4] The author of this report was unable to obtain copies of the ASAP's M&E plan, so this information may no longer be current.

mission's strategic objectives, which seems unlikely. If such a shift has occurred, it is a good sign; it would mean that increases in agricultural production in Malawi must be environmentally sound to be considered successful.

C. Uganda

1. Agricultural Nontraditional Export Promotion (ANEP) Program/Project and Investment in Developing Agricultural Exports (IDEA) Project

Uganda's EMEMP is designed to monitor the environmental impacts of two projects, the ANEP and IDEA. The ANEP began in 1988, with a primary focus on policy reforms to liberalize the economy in general and the agricultural sector in particular. The project created an Export Policy Analysis and Development Unit (EPADU) in the Ministry of Finance and Economic Planning as a policy shop to do analytic work on trade issues. The ANEP has been amended several times, with the final amendment coming after enactment of the DFA legislation, which requires environmental safeguards in policy-reform programs. Phase II of the ANEP, being designed during 1994, will continue the work of the ANEP I through continued project support to the analytical work of the EPADU, establishment of a venture capital fund for new enterprises, funding for data development, and other related activities.

The IDEA Project was developed in 1993, and a team is expected to begin work on it by fall 1994. It is a $25 million, five-year project to increase output of nontraditional agricultural exports (NTAEs). Project designers have selected several crop sectors for emphasis: maize, beans, oil crops, spices and essential oils, cut flowers, vegetables, and fruits. The focus of the project's inputs will be on overcoming production and marketing constraints by providing technical assistance, training and small grants to producers, processors, and exporters of NTAEs, and by funding a program of research on crop production and processing strategies within the National Agricultural Research Organization (NARO). Most IDEA activities will be managed through an Agribusiness Development Center to be established by the contractor awarded the project, with smaller awards going to NARO for research and to the Peace Corps for related field activities.

2. Action Program for the Environment (APE)

The APE is a natural resources management and biodiversity support program designed to assist the public and private sectors to manage the country's resource base effectively and sustainably. The program will be collecting substantial data on the environment and has, therefore, been identified as a key source of information for the IDEA/ANEP's EMEMP. It began in 1991 and is to last five years. It has several distinct components. First, the APE is supporting implementation of the NEAP through review of proposed investment projects, the development of environmental review regulations, and support for creation of a National Environmental Information Centre (NEIC). Support for the NEIC is expected to include funding for the establishment of a district-based data collection system to build the information base needed for local planning, including consideration of the natural resource base in the planning

process.

Second, the APE is providing grants to NGOs to develop and implement integrated conservation and development projects (ICDPs) in the buffer zones surrounding key protected areas. These projects are designed to foster alternate income-generating activities for buffer area populations, which will reduce their need to depend on depletion of the protected areas for their livelihoods. Within the program, the APE has created a Grants Management Unit (GMU) to handle awarding and management of these grants. Through the GMU, the APE is also asking NGOs to begin standardized data collection to monitor the impacts of their activities, both on the incomes of buffer-zone populations and on the quality of the resources in the protected areas.

Third, the APE is providing management support to Uganda National Parks to enable the agency to improve management of the resources within the protected areas. This includes working with agency staff on collection of data on encroachment of protected areas by adjacent populations, which are designed to complement the NGOs' data and demonstrate whether ICDPs are having an impact on protected resources.

3. The NEAP and the NEIS

Uganda has prepared a NEAP, with extensive participation from many government agencies and support from USAID. The NEAP secretariat is working in several areas. It is developing procedures and regulations for environmental impact assessment. It has proposed an institutional structure for environmental management, including creation of a new National Environmental Management Agency, which the legislature is now reviewing. The Secretariat has also proposed a number of investment projects in the environmental arena.

The NEAP secretariat includes a quasi-autonomous National Environmental Information Centre, which aspires to be a policy analysis group furnishing data and value-added analytical products to policymakers upon request or in response to perceived needs. Its manager hopes to build a network among government data producers to facilitate data sharing, work on data standardization, and to identify priorities for new data development. One area of particular concern to the NEIC is clarifying and loosening the restrictions on public access to information, which now make it difficult to obtain disaggregated data. The NEIC does not intend to centralize either primary data collection or data management and storage; rather, it would like to serve both as a direct data user in its own analytical work and as a clearinghouse through which other data users can locate the information they need.

At present, the NEIC has neither the funding nor the legal authorization to proceed with this agenda. Instead, it is working on more specific data-management tasks. One such task is the preparation of a series of district environmental profiles, which describe in text and tables the environmental conditions and problems of individual districts. These have been prepared for a few districts, and the NEIC hopes to obtain funding for more profiles. The second task is the development of databases, mentioned above, to support district-level planning. Local government agents will collect these data and provide them to the district level for use in

decentralized planning. Through the APE project, USAID expects to fund the implementation of this system in up to six districts.

4. General description of the EMEMP

Uganda's EMEMP is designed to meet the environmental monitoring requirements of the ANEP I, IDEA, and ANEP II. The first step in designing the EMEMP was the preparation of an IEE for the last amendment of ANEP I. That document, completed in September 1992, recommended three activities:

- An environmental impact assessment for the ANEP's activities implemented by that date. This was intended to provide a background understanding of how the policy reforms are affecting the environment and to serve as a basis for developing the EMEMP.
- Completion of individual environmental impact reviews (EIRs) for sectors of focus for the ANEP.
- Continuing EA review of individual activities funded through the project.

The overall impact assessment for the ANEP's activities was not completed because it was not thought cost-effective to try to establish a clear relation between macroeconomic policy reforms and environmental change. The ANEP/IDEA EMEMP document, prepared in June 1993 (ANEP 1993), recommended a slightly different course of action:

- EIRs to be prepared for the five sectors that the IDEA project will target. These were completed in the winter of 1994 (Morton, Sergeant, and Smedley 1994). The reviews describe the anticipated impacts of increased output in the selected crop sectors, propose a set of actions that can prevent environmental harm, and suggest indicators to monitor at the national and local levels.

- Establishing an environmental monitoring and evaluation (EM&E) system to track the impacts of the IDEA's activities. This system will require two kinds of data. The first concerns the project's impact on production and export of nontraditional crops. The second concerns the environmental impacts of that production. The system is to include the development of baseline data from secondary sources and a set of indicators of environmental change to be tracked over time; an annex to the EMEMP documents gives a list from which such indicators might be chosen. The EMEMP suggests that the IDEA project collect the agricultural data and the APE and related NEIC information-development activities provide the environmental data.

- Establishing an environmental assessment procedure to be followed for activities funded under IDEA. Using the information about specific producers obtained through this procedure, the staffs of the ANEP and IDEA projects will develop strategies to prevent or mitigate environmental harm caused by agricultural production. These procedures are also expected to contribute to, or perhaps be a test case for, efforts through the NEAP to develop environmental assessment procedures for the Government of Uganda's (GOU)

activities. The EMEMP anticipates that researchers at Makerere University will conduct these assessments, using local currency funding provided by the APE and possibly IDEA.

The EMEMP calls for two expatriate consultants to determine the details of how this would be done, particularly the design of baseline data and the EM&E system. As of June 1994, no plans had been made to involve such a team.

5. Identifying anticipated impacts on environment

The EMEMP document describes the environmental impacts of the ANEP and IDEA activities in general terms, focusing in particular on the different impacts of agricultural extensification versus intensification. These impacts are discussed in greater detail in the IDEA's EIRs, which consider the particular conditions under which each of the target crops is grown, possible use of agrichemicals, and the environment affected by the sector.

6. Allocation of responsibility

Responsibility for implementing the EMEMP is to be divided among several actors. USAID/Uganda will have overall responsibility for the system, according to mission staff (Jim Dunn, personal communication, 1994). Details of how this is to be arranged are being developed. The EMEMP recommends the use of a consultant team to design the monitoring system and map its implementation, but this has not yet been done. Although the APE is expected to provide data to monitor the environmental impacts of increased production of NTAEs, the APE staff had little awareness of what this expectation might entail, and expressed some reluctance to respond to it (Rob Clauson and Jim Seyler, personal communication, 1994). The IDEA's request for proposals (RFP) included the EM&E system among the tasks required of the contractor and requested a plan for implementing that system as part of the M&E strategy included in offerors' bids. This requirement in the RFP is likely to add to rather than resolve the problems because bidders have only limited information about the EMEMP and the secondary data available.

Thus the situation has been one of some confusion, for a number of reasons. USAID's regional environmental officer (REO) prepared the initial EMEMP document (ANEP 1993), but this preparation was done outside of the project's design process. The project's objective is to increase agricultural production, without any particular focus on environmental issues. The mission staff responsible for the project and for its monitoring and evaluation system are agricultural experts, who, believing that they need help on the environmental side, have relied heavily on the REO. Understandably, they see the EMEMP as something of an outlier to their work programs, so the REO and other outside consultants have taken the lead in addressing the issues that the EMEMP raises. Moreover, the original EMEMP document was complex and confusing; mission staff did not understand it and were reluctant to take responsibility for its implementation. A second version (Loken 1993b) considerably simplified it but omitted many key issues. A third version (Loken 1994) made substantive changes in the recommendations. Unfortunately, the current version will not be available to the contractors producing

implementation plans in their proposals.

A meeting held at USAID/Uganda in June 1994 (just after the author had left the country) brought together the APE staff, the USAID staff responsible for IDEA and ANEP, the PRISM team, the REO, and the director of NEIC to discuss the EMEMP. This was the first time that the EMEMP was explicitly discussed with the institutions expected to provide most of its data. The participants reached four general conclusions (Keith Brown, personal communication and notes, 1994):

- A consultant should be hired to design a system to monitor encroachment into protected areas, working with the director of the NEIC. (Presumably this will build on the work in this area that the APE has already completed).

- The agriculture and natural resources office of USAID/Uganda or the IDEA contractor team will monitor national data on NTAE outputs and inputs.

- The contractor will collect local data on farm and processor activity at the beginning, middle, and end of the project.

- For firms supported through the project, the emphasis will be on preventing harm rather than monitoring and subsequently mitigating if needed.

These conclusions leave many questions unanswered, but the lines of communication established through the meeting should make it easier to resolve them than it has been in the past.

7. Funding for preparation and implementation

The budget for the IDEA project includes $500,000 for monitoring over the project's six-year life. This sum covers the EMEMP and the project's M&E system, though not the project evaluations. Mission staff hope to minimize the amount required specifically for environmental monitoring by relying on data that the APE Project and NEIC collect. The environmental assessments for activities funded through IDEA will apparently be funded through a separate IDEA line item.

It is not yet clear what will be involved in implementing the EMEMP, so it is not possible to determine whether this funding will be adequate. The EMEMP should be designed more fully over the next few months, however, so more information will be available soon. Since this EMEMP is also to be linked to ANEP Phase II, whose design will not be set until late 1994, there will be a window of opportunity to obtain additional funding through the ANEP once it is determined what is needed.

8. Specification of data to be collected, timing, and establishing causality

Various EMEMP documents address the questions of what data should be collected, but

there are still many questions to resolve. In general, these data are of two types, those related to agriculture, including NTAEs, and those related to the environment or natural resources. The monitoring plan (ANEP 1993) indicated that each type of data should be collected at the national, regional, and local (individual producer) levels. Annexed to the plan is a preliminary list of recommended indicators for each type of data at each level. For each item this list gives the type of data desired and the units of measurement, but its specification of the variables to be monitored is general.

At the national level, this list includes such items as the hectarage, yield, and value of major and NTAE crops, use of fertilizers and pesticides by weight or volume, the hectarage in parks, protected areas, forests, wetlands, and other major land cover categories, the number of incidents of encroachment into each of those land cover categories, and so on. The list does not consider where such data might be obtained, which are likely to be easy to acquire and which will be difficult, or the technology required to obtain the data (e.g., interpretation of satellite imagery or ground collection). It does mention that the data should be available from national sources, although no one involved with the EMEMP or the projects it is to serve has surveyed national sources of data about agriculture or the environment.

At the regional level the list anticipates a need for the same data as required at the national level but for each district the projects affect. There is no discussion of scale or level of disaggregation for the data. National agricultural statistics often can be disaggregated to the district level but are not meaningful when disaggregated further. This issue will have to be explored, along with the general availability of the data in this list. The list also recommends the development of a database on processing facilities for NTAEs, including inputs used and waste discharged from each facility; this will require the project to collect primary data. Of course, these are not regional data; they will be collected at the plant level and are, therefore, local. They could be aggregated to the district level, though it may not be meaningful to aggregate data on water or air pollution. The data required at the local level are also by producer or processor of NTAEs. In fact, it would appear that there are not many data proposed that are actually regional; they are either about individual enterprises or they are national data systems disaggregated to the regional level.

The EIR discusses indicators of agricultural activity but not of environmental impact. Its national data recommendations touch on the same topics as the EMEMP, asserting that the data will be available from the GOU or various agencies of the United Nations. (U.N. data come from the government, so the EIR is, in fact, only anticipating use of the GOU's data.) The EIR drops the regional data collection but distinguishes between data to be collected from NTAE producers and processors. The report recommends that the staff associated with the IDEA contract survey farmers and processors annually to collect the data.

Neither the EIR nor the EMEMP discuss the timing of data collection, particularly how long it will be before the impacts of the IDEA and the ANEP activities can be observed or how many years of baseline data are needed. The EMEMP cable (USAID/Uganda 1994), prepared in response to a request from the Bureau for Africa, suggests that it may be necessary to extend

monitoring beyond the current duration of the project components of the IDEA and ANEP or obtain local currency funding for monitoring to continue. The availability of funding through the second phase of the ANEP, mentioned above, may extend the time frame for monitoring as well.

The EMEMP document notes explicitly that it is unrealistic to try to show a causal link between the policy reforms and environmental harm (ANEP 1993, 8). This is the logic for not pursuing the retroactive environmental impact assessment for the ANEP's activities since 1988, which the IEE proposed for the most recent ANEP amendment. In contrast, the farm and processor surveys proposed in the EIR should shed some light on issues of causality. The surveys will target new NTAE producers who presumably are responding to opportunities that the IDEA program creates. The issue of showing a causal link at the local level will have to be explored more thoroughly than has been done in the EMEMP process so far, in connection both with these surveys and with the research to be conducted through Makerere University.

9. Evaluation

The EMEMP and the EIR advocate periodic reports that review the data collected and discuss them at workshops at which "appropriate remedial measures could be recommended and agreed upon." The EIR calls for USAID mission staff to analyze the data and to disseminate the results to interested government agencies. It does not discuss the procedures or criteria for evaluation.

10. Mitigation, Prevention, and Environmental Assessment

The EMEMP and the EIR both discuss mitigation issues, although in different ways. The EMEMP first refers to the activities proposed in the original IEE for the project component of the ANEP, mentioning that they were in part intended to help the GOU establish a program to mitigate any environmental harm. This would imply that mitigation is the government's responsibility rather than of the USAID project causing the harm. The EMEMP then proposes a three-part mitigation program for the ANEP and IDEA.

The first element in this program involves environmental assessments for activities funded through the project. Although this element aims to prevent harm rather than to deal with it if it occurs, it is clearly a reasonable approach to take. That environmental assessments are considered part of a mitigation program suggests the difficulty in separating prevention and mitigation, if we are to take a proactive rather than a reactive approach to environmental protection.

The second element is to encourage research on environmentally sound agricultural practices through funding provided to Makerere University. The hope is that these practices will be incorporated into the technical assistance package provided through the ANEP or IDEA, thereby preventing any negative environmental impacts. Such research is encouraged and should be beneficial in the long run. Since research and technical assistance will begin at the same

time, however, the results will not be available until some years into the project and cannot be used to prevent environmental harm from activities associated with the ANEP or IDEA.

The third element is to use IDEA funds to strengthen the quality controls on Ugandan exports and imports. On this import side this would be intended to prevent introduction of potentially hazardous exotic species or pest organisms, as well as of hazardous chemical inputs. On the export side, strengthened quality controls would both ensure the safety of Ugandan produce and provide an additional check on the use of pesticides. This strategy would get at some, though not all, of the environmental harms that the ANEP and IDEA could cause.

The EIR takes a different approach to mitigation. It seems to assume that it will be possible to show a causal link between the ANEP/IDEA activities and environmental degradation through the producer and processor surveys and related collection of field data. For each crop sector, the authors suggest strategies to minimize possible environmental harm. These vary by sector, but they tend to focus on providing agricultural extension services to encourage intensified cultivation and increased yields and discourage expansion onto currently uncultivated land. The authors also recommend research to develop low-impact input packages that will lead to increased yields.

The EIR places explicit responsibility for mitigation in the hands of USAID's project managers, not the GOU. For this reason, its authors feel that monitoring for the EMEMP must be part of the M&E system and should be a criterion by which project implementation is judged. For the same reason, they place primary responsibility for data analysis in the hands of USAID or its contractors, since the authors consider USAID to be liable for any harm that occurs as a result of the project. USAID staff disagree with this aspect of the EIR, believing that the GOU is clearly responsible for mitigating any harm that might result from the project.

11. Links to the APE and the NEAP/NEIC

The EMEMP's designers expect it to be linked closely to the APE project and the NEIC's data collection that the APE will fund. It is assumed that the APE will collect information about encroachment into environmentally sensitive areas, meeting the EMEMP's needs for its second type of data, on the impact of NTAE expansion on the environment. Unfortunately, the EMEMP's designers did not look closely into the data development work planned under the APE (Eric Loken and Rob Clauson, personal communication, 1994). In fact, the overlap between the two projects may not be sufficient to meet the EMEMP's needs.

The APE is planning several types of data collection. One is the monitoring of ICDPs in buffer zones around protected areas. The monitoring of these projects, which has been the subject of much discussion within the APE's Grants Management Unit (GMU), will provide data to show whether or how the NGOs' activities affect the incentives for local communities to encroach on protected areas. To the extent that EMEMP-related projects also affect buffer zones, these data could be useful for the EMEMP. Nonetheless, a note of caution is in order. The APE has already invested considerable efforts in designing this system, particularly in

convincing the NGOs that they can collect the relatively limited standardized data. Accordingly, it would be difficult to change it now to meet the EMEMP's needs.

A second kind of data anticipated by the APE concerns encroachment on protected areas, particularly those around which the activities of NGOs are occurring. These data, which the park staff will collect in the course of their work, have not yet been identified. The APE's staff have expressed some doubts about whether it will be possible to collect reliable data. To the extent that there is geographic overlap, this might provide some information about the impacts of the ANEP's and the IDEA's activities. USAID's REO has argued that these protected areas constitute the country's most vulnerable zones, so even if they include only a small portion of the area that the IDEA's activities affect, the zones include the most crucial areas (Loken, personal communication, 1994). According to this reasoning, limiting the collection of environmental data to those areas would be acceptable, since the data obtained would identify the worst impacts that might occur. This view was incorporated in the June 1994 version of the EMEMP document (Loken 1994, 4). At the EMEMP meeting of June 1994, discussed above, USAID/Uganda and the APE's staff agreed to compare the geographic areas covered and the issues the two projects address in order to determine whether this approach is realistic.

The third data source anticipated from the APE is the district-level information mentioned above, to be developed with the NEIC. These databases, which are still in the design stage, are intended to support decentralized planning for economic development. The environment is a key part of the economy in rural areas, so the APE is considering funding a pilot project to collect data for six districts. An APE consultant has proposed a design for the system, including the data to be collected and the districts to be covered. Some of these data could be of use in the EMEMP's monitoring, although the exact link would have to be established jointly among the APE's staff, the EMEMP's designers, and NEIC. The system is still being designed, so there is a window of opportunity for the EMEMP's needs to be considered, and possibly for the pilot districts to be chosen so as to include areas that the ANEP and IDEA activities are likely to affect. Such collaboration will require careful negotiation and will require those responsible for the ANEP and IDEA to refine their needs quickly in order to integrate with the APE/NEIC system before it is too late.

The APE's staff were largely--at least officially--unaware that the EMEMP expects to depend on them for a major portion of its data. No one involved with the EMEMP had approached the staff about their data collection or collaboration between the two projects. Hearing about this from unrelated consultants rather than from those who need the data, their attitude was somewhat defiant; anyone is welcome to use their data, but they were not willing to change their plans or reallocate their resources to meet needs other than their own, at least during the time the research for this assessment occurred.

12. Links to other USAID monitoring

Several links are planned among the various monitoring systems in Uganda. First, and simplest, the local-level agricultural production and processing data needed for the EMEMP

should be the same as much of the data the M&E system needs. These data will be designed to determine the impacts of the IDEA on production and processing of NTAEs, so they should meet both purposes. Whether this is understood to mean that the EMEMP is providing information to the M&E system, or that there is a single system meeting two needs, the integration should be straightforward.

Second, the links between project monitoring systems and the API, PRISM, or other mission-level monitoring systems involve identifying selected information from the "lower-level" systems that can be used to track the mission's subobjectives or objectives. The EMEMP's data will be useful in this connection insofar as they provide insight into changes in incomes from agricultural exports. Such changes are among the mission's objectives for the agricultural sector. Project or mission-level systems will not use the EMEMP's data on the environment because project and mission objectives do not relate to sustainability or environmental protection. The APE data will appear in the more abstract API monitoring system, in connection with the mission's biodiversity objectives, but this is not related to the EMEMP.

D. Madagascar

1. Commercial Agricultural Promotion Project

The Commercial Agricultural Promotion (CAP) Project is designed to increase marketed agricultural production in two high-potential zones (HPZs), Fianarantsoa and Mahajanga. The project has three components:

- The agribusiness support-services component will provide technical assistance to targeted producers and producer groups to strengthen the marketing of agricultural produce and the management of agribusiness.

- The input supply fund (ISF) will help producers purchase inputs and equipment that can facilitate production, processing, and marketing of agricultural products. This fund will provide foreign exchange to those wishing to import inputs but will not provide credit or subsidies. USAID's project officer will manage the fund and approve all ISF procurement. The local currency thus generated will be placed in a special fund, which is the third component of the project.

- The resources in the local currency fund (LCF) will be used primarily to improve transportation and communications infrastructure, in order to reduce the costs of bringing agricultural produce to markets and distributing it.

The two HPZs were selected in part because USAID's NRM projects in Madagascar are also working there.

2. Market Infrastructure Expansion Project

The Market Infrastructure Expansion (MIX) Project, scheduled to begin in 1995, is viewed as a companion project to the CAP. MIX is a five-year, $10 million effort to increase economic activity by improving market infrastructure, through an integrated program of training, technical assistance, and matching grants. The MIX project will work in the same districts as the CAP, and its support is considered essential to complement the CAP work and reinforce its support to agribusinesses. A Programmatic Environmental Assessment (PEA) is to be conducted jointly for MIX and the CAP's infrastructure components.

3. Madagascar Agricultural Export Liberalization Support Project

The Madagascar Agricultural Export Liberalization Support Project (MAELSP) began in 1988 as the project component of an agricultural liberalization program. All local funding has been disbursed, but the project component has been amended and extended through 1995. The project is now providing technical assistance to develop specific export subsectors, supporting human resources development in exporting firms, and conducting studies to identify and address specific impediments to private sector development. Several commodities are targeted: Arabica coffee, dried beans, spices, oils, fruits, vegetables, and ornamental plants.

4. Madagascar-International Rice Research Institute (IRRI) Project

The Madagascar-IRRI Rice Research Project began in 1984, and is now in it third phase. It has been involved with research and extension on regional rice specialization, intensification of small-scale production, off-season cropping, and the promotion of locally manufactured processing equipment.

5. Sustainable Approaches for Viable Environmental Management

The Sustainable Approaches for Viable Environmental Management (SAVEM) Project began in 1990 and was recently extended through 1997. The $40 million project focuses on developing sustainable practices for the management of protected areas. SAVEM works closely with the Association Nationale pour la Gestion des Aeres Protégés (ANGAP, or the National Association for Protected Area Management). The project is supporting ANGAP institutionally, establishing a biodiversity planning service, preparing management plans for up to six protected areas, providing community action grants, and offering training to government and NGO personnel. A grants management unit is handling the community action grants, each of which must have its own M&E system to track impacts on development and the environment.

6. Knowledge and Effective Policies for Environmental Management Project

The Knowledge and Effective Policies for Environmental Management (KEPEM) Project is a five-year combined project and NPA activity that encourages policy and institutional changes needed to increase the sustainability of Madagascar's conservation activities. It has three main elements:

- support to the Office National de l'Environnement (ONE) for the planning, monitoring, and evaluation of the Environmental Action Plan (EAP);
- facilitation of local-level NRM initiatives through policy and regulatory reform and through support to indigenous NGOs; and
- the strengthening of sustainable resource-based income, through reform of pricing for forest products and establishment of a national environmental endowment fund that will finance environmental activities.

7. National Environmental Action Plan

The NEAP is being implemented through a 15-year process now in the middle of its first 5-year phase (EAP I). This phase focuses on:

- biodiversity protection and management;
- soil conservation, agroforestry, reforestation, and other rural development activities;
- maps and geographic information;
- land tenure and cadastre development;
- training and public awareness;
- ecosystems research; and
- institutional capacity building, including environmental information systems.

Implementation of the first phase of the NEAP through EAP I is a major multidonor effort, with several projects providing support. In particular, the United Nations Development Programme (UNDP) and the African Development Bank (ADB) are planning short-term technical assistance (through the UNDP) and a major project (through the ADB) to support the Office National de l'Environnement (ONE) in the development of information systems both for environmental management and for inclusion of environmental considerations in the national income accounts. These systems could eventually provide data relevant to the CAP, MIX, and MAELSP, but it will be several years before any information is available.

8. General description of the EMEMP

The CAP's IEE recommended different environmental actions for different components of the project, as summarized Table 1. Thus the EMEMP is to address the possible environmental impacts of activities funded under the ISF. Initial work on the EMEMP was done in the context of an environmental analysis of the CAP project prepared in February 1994 (Loken and Knausenberger 1994). The environmental analysis explicitly states that the EMEMP should link the CAP's M&E plan, the M&E systems that KEPEM and SAVEM will establish, and the EIS planned under the NEAP, though it does not explore the nature of these linkages. The analysis also recommends that the EMEMP cover MAELSP as well as CAP and MIX, because its objectives and likely impacts on the environment are similar. The environmental analysis and the IEE advocate preparation of a programmatic environmental assessment (PEA) for the road-building components of the CAP and MIX. The EMEMP covers only project components that do not require the PEA or a pesticide sector assessment (PSA), so these

additional assessments should not delay the EMEMP's implementation. The environmental analysis refers to an EMEMP document to be prepared later, which will presumably go beyond Loken and Knausenberger's report and provide details on many issues discussed only briefly in the initial review.

Table 1: Findings of the CAP's IEE

Activity	Determination
Agribusiness support services	Categorical exclusion.
Input supply fund	Negative determination conditionally upon implementation of the EMEMP and subject to the condition that further environmental review may be required if the ISF list of eligible commodities changes or USAID/Madagascar changes its focus. In addition, the list of chemicals for which import ISF funds may be used received a deferral, pending completion of a pesticide sector assessment (PSA). Moreover, that chemical use will also be subject to a programmatic environmental assessment (PEA) when they are actually used.
Local currency fund for improved road transportation network	Positive determination requiring completion of a PEA for the upgrading of roads and for the MIX.
Local currency funds for market information system	Categorical exclusion

As in Uganda, the section of the CAP's environmental assessment on EMEMPs distinguishes between data showing the project's impacts on agricultural activity and data showing the impacts of agricultural activity on the natural environment. Data needed on agricultural activity are outlined in the M&E plan included in the CAP project paper and are targeted towards the API indicators for the second strategic objective, increasing trade from HPZs. The same data needs are anticipated from the EMEMP, so these should be integrated.

9. Identifying anticipated impacts on the environment

The environmental analysis of the CAP and related activities reviews the possible impacts of the ISF-supported activities for which the EMEMP is required but does not address the pesticide and infrastructure activities the PSA and PEA will investigate. Thus the EMEMP

considers the same issues raised in most EMEMPs, namely the possible different impacts of agricultural extensification and intensification. Extensification is considered more potentially harmful than intensification, particularly in Fianarantsoa, where high population densities are leading to land degradation and cultivation of low-quality land. The analysis also considers possible impacts of agricultural processing, which can affect the environment through construction, water and air pollution, and impacts on the health of workers or consumers.

The analysis suggests that a number of significant adverse impacts could result from the ISF-funded inputs. It asserts, however, that because mission staff view this project as a "de facto...ICDP approach," the economic development the project will generate will reduce any environmental degradation by offering "alternative, environmentally sustainable opportunities for economic gain and advancement" (Loken and Knausenberger 1994, 38). That is, because the mission is also undertaking resource conservation projects (KEPEM and SAVEM), the net environmental impact of the mission's portfolio is expected to be positive. In addition, the CAP's activities are expected to reduce pressure on adjacent protected areas because they increase possible incomes from agricultural production.

With respect to the possible environmental harm from those alternate sources of income--from extensification into protected areas, pollution or erosion caused by use of ISF-supported agrichemicals or machinery, water pollution caused by new or larger processing plants, or other potential harms the authors identified--the analysis indicates that because USAID/Madagascar hopes to implement these activities in an environmentally friendly way, it is acceptable to give the project a negative determination. There is no further justification in the report for the assessment that the mission will, in fact, succeed in achieving their intention to protect the environment.[5] It is also not clear to what extent the CAP will support agricultural extension services to affect how the ISF-supported inputs are used. In reaching the conclusion that the project will not be environmentally harmful, the document does not distinguish clearly enough among types of harm, grouping them together to assert that, on balance, the CAP is expected to benefit the environment by creating new sources of income. We must hope, therefore, that if harm does occur it will be detected through the EMEMP's monitoring and that mitigation will be required at that time.

10. Allocation of responsibility

The discussion of the EMEMP in the environmental analysis raises the issue of who is to be responsible for implementation but does not explore this in detail. The plan proposes that mission and project staff be responsible for gathering data on agricultural activities and socioeconomic information about the affected communities. More specifically, this should be a responsibility of the technical agents that the CAP will place in the field to work with agricultural producers in the two HPZs. The analysis document also anticipates that these agents will undertake mitigation work, presumably playing an extension role as well as supporting

[5] Due to the limited information available about Madagascar, this issue might be addressed in a different way elsewhere in the literature, making this point invalid.

business development and marketing. The contractor for the CAP is instructed to complete a more detailed EMEMP design and a strategy for its implementation as part of the initial project workplan. The contractor was not aware of these expectations, however. The analysis report also proposed that SAVEM, KEPEM, and institutions working with those projects should supply all environmental data needed for the EMEMP but does not indicate whether the staff of those projects consider this to be among their responsibilities.

11. Funding for preparation and implementation

The environmental assessment does not address how data collection for the EMEMP will be funded or how much it might cost. Developing a detailed budget is one of the implementation steps indicated in the environmental assessment; this is apparently a responsibility of the CAP contractor. It would appear that the collection of agricultural data is to be financed with the CAP's M&E funds, and SAVEM and KEPEM will pay for collection of environmental data.

12. Specification of data to be collected, timing, and establishing causality

The description of information needs in the environmental assessment is general (Loken and Knausenberger 1994, 44). Agricultural data are to cover volume of production, areas cultivated, production technologies, use of human, chemical, and machinery inputs, and agricultural practices. These data are expected to be available in sufficient detail to suggest effective mitigation strategies if required. Environmental data are expected to address land use, land cover, forests and vegetation, agricultural encroachment in forest land, rangeland, and fallows in sufficient detail to understand the impacts of agricultural change on the environment. The data should also cover wildlife, soil quality, water quality, and environmental health issues.

The EMEMP section of the analysis report indicates that much of the data on both agriculture and the environment should be available from government sources. Despite this assumption, no one has yet contacted any government agencies to determine what kinds of data are available, at what level of disaggregation, or for what time periods. The report lists a number of government agencies that might have data, but this has not been verified.

The report does not deal with the timing for the EMEMP's monitoring at all. The report mentions that baseline data will be needed but does not specify what they are to cover or for what time period they are needed. Not surprisingly, the report also does not address the issue of whether the EMEMP should show a causal relation between the CAP's activities and environmental harm. The emphasis on collecting data about individual producers and processors, through the CAP M&E system, suggests that showing some causal relation may be feasible. The general approach to the EMEMP anticipates that local data will be sufficient to understand "causal and other factors contributing to the observed developments" (Loken and Knausenberger 1994, 42). Considerable work will be required to determine how this could be done, but the authors of the analysis do seem to consider it important.

13. Mitigation and environmental assessment

The environmental analysis appears to anticipate implicitly that the CAP will require mitigation because significant harm could occur, and it would be difficult to predict and thus prevent. The report calls for the information on the causal factors mentioned above in order to design remedial measures (Loken and Knausenberger 1994, 42); this certainly anticipates a need to mitigate harm that the CAP's activities will cause. The report offers a list of suggested mitigation techniques to help protect the environment: extension activities to promote use of sustainable cultivation and appropriate use and management of agrichemicals, research to identify those sound practices, and impact assessment or audit requirements for the activities of CAP-supported firms. The future EMEMP and PEA are expected to determine more precisely what these mitigation strategies might entail. There is no mention yet of who might be expected to implement or fund them.

14. Links to government information systems

The information available so far does not suggest any strong links between the EMEMP for the CAP and existing or planned government activities. The EMEMP calls for the government's statistics offices to collect secondary data to the extent that they are available but does not support those offices financially or with technical assistance. The primary data to be collected directly through the CAP concern agribusiness activities, and CAP technical agents are to collect such data rather than through any government research or agricultural agencies. The environmental data that KEPEM and SAVEM provide may originate with USAID's support to the agencies collecting or managing the data, but it is not possible to determine this from the available information. Any of these links could be strengthened as the EMEMP is refined, but it does not appear to involve significant institution-building activities that will strengthen the government's environmental information systems in the future.

15. Links to other USAID projects or monitoring

The CAP's EMEMP is to be linked to at least two other monitoring systems. First, as mentioned, the agricultural data for the EMEMP are to be obtained through the CAP's impact monitoring system because the information required is essentially the same. Only one actor, the CAP contractor, will be responsible for this activity, so ensuring that the data meet both the needs of both the EMEMP and the M&E system should not pose problems. Second, environmental data for the CAP's EMEMP are to come from KEPEM, SAVEM, and other mission environmental activities. The available information is not sufficient to indicate whether this will work well, whether there is enough overlap between those projects and the CAP for them to be able to provide the right information, or who will pay the costs.

The CAP's EMEMP is also to be linked to the MIX project and MAELSP, whose objectives and possible environmental impacts are close to those of the CAP. Although a single EMEMP will address all three projects, there are apparently no plans yet for the other two projects to play a role in funding or managing the monitoring system. MAELSP is already

operational, so it might be difficult to integrate environmental monitoring into an existing project structure. The MIX project is not scheduled to begin until 1995, however, so it can offer an opportunity to create a broader joint environmental monitoring system, rather than a system tied narrowly to a single project. Although it has not been framed this way at present, the notion of a broad monitoring system cutting across projects may become more interesting in the future, as USAID moves towards funding at the strategic-objective rather than the project level.

Chapter 3. Discussion

As anticipated in the first chapter, it is too early to assess whether the EMEMPs are effectively protecting the environment against potential harm that USAID's projects, programs, or policy reforms might cause. Moreover, if EMEMPs do succeed, such assessment may never be possible; if no environmental harm is observed, how will we know whether this was due to the EMEMP or because the project was not harmful? Only if harm is observed through EMEMP-funded monitoring will we be able to maintain that an EMEMP has worked. This is unfortunate. If a goal is to prevent harm, it would be useful to be able to tell whether we have an approach that can do so in the face of serious threats.

It is more feasible to review EMEMPs from the perspective of whether they include key elements discussed in the first chapter. Some of these issues do not seem to raise particular concerns. For example, all of the EMEMPs consider a program's anticipated impacts on the environment. For complex programs affecting different agricultural sectors differently, such as Ghana's TIP and Uganda's IDEA, this is done thoroughly in special analytical studies. For others, such as Malawi's ASAP, the EMP is considerably less detailed. In all cases, however, the analysis is adequate to identify general impacts that can be anticipated.

All the EMEMP processes begin with a brief consideration of what should be monitored. In Ghana and Malawi, the two countries where data collection has begun, the contractors (expatriate or African) have refined the data identification as they began implementation of their EMEMPs. This process is adequate for designing a practical system to implement the monitoring. It raises broader questions about how monitoring needs are being defined, however, and what we will actually learn from the EMEMP's findings. These are discussed in this chapter, which initially considers some of the specific components of EMEMPs listed in the report's first chapter. It then considers the broader frameworks of sustainability and links to other government or USAID activities.

A. Baseline data and the timeline for monitoring

The specification of required baseline data is weak in the EMEMPs examined. In part, of course, this is an unavoidable response to the lack of available data about the environment with which to establish a baselines. Despite this situation, most of the EMEMPs recommend baselines, but do not consider what those data would indicate or what kinds of data would be needed to observe changes due to USAID's intervention. This is related to another component of EMEMPs, the time frame for monitoring. To determine what is to be monitored and to specify how particular data would answer questions about the impact of the program, two distinct issues are relevant. First, what is the time frame within which we expect to observe impacts? Second, how will we distinguish environmental change the program causes from other unrelated change? The second issue often depends on building a time series of baseline data with which to establish a range of normal variation that can help interpret the data observed. Moreover, often the impacts of the USAID program cannot reasonably be observed until it has been operating for several years. This can provide an opportunity to build a baseline of time-

series data, despite the poor historical data already available about the environment. Of course, it also means that USAID's support may no longer be available by the time any impacts might be anticipated. (This problem is not particular to EMEMPs but is common to many M&E systems.) Therefore, EMEMPs should consider the related issues of baseline data and the time horizon for monitoring explicitly; this was not done in the EMEMPs reviewed.

B. Data sources

EMEMPs characteristically anticipate reliance on a variety of secondary sources of data, from host governments, other projects, and other donors. Despite these expectations, none of the EMEMP processes have included a systematic review of data sources to determine whether the available information will actually meet the need. Some heroic assumptions are made; for example, that if the agricultural statistics office collects data about major crops, it will include the crops that USAID's agricultural export promotion project targets. Where agricultural statistics systems are designed to monitor food security rather than the economy--as is the case in many African countries--they will not cover crops that are a minor source of food, even if they are a major source of foreign exchange. Reliance on secondary data sources is absolutely appropriate, but its feasibility depends on precisely how those data are structured, their level of detail, and their geographical coverage. It is possible to design monitoring systems for EMEMPs around available data, but to do this it will be necessary to know at the start what those data are. This determination should not be left until late in the process, when an EMEMP's implementation is too advanced to allow the changes in staffing or resource-allocation decisions needed to work with available data.

C. Data analysis and interpretation

None of the EMEMPs explicitly address how the data are to be analyzed or interpreted. Data analysis can be straightforward. If there is any environmental harm, however, then interpreting the results could pose both technical and political problems. Technical questions will concern what level of harm is considered acceptable and what criteria are used to establish such standards. EMEMPs should consider how standards will be set and what information and criteria can be used to do so. Political issues will concern who has access to the data and who determines whether the observed harms are acceptable. In western countries, public access to data on the environment has played a major role in environmental protection, as citizens' groups have fought with public and private agencies to block activities causing harm. Citizen groups do not have the same force in Africa, but USAID is interested in encouraging public participation and supporting NGOs, so this issue should be addressed in designing EMEMPs. Such participation is particularly important in light of the criticisms that the World Bank has faced for its past practices of undertaking environmentally harmful projects and limiting public access to the information with which it could be criticized intelligently.

D. Mitigation and prevention of environmental harm

EMEMPs vary considerably in their approaches to mitigation, with respect both to what

it might entail and who will be responsible for it. In practice, the focus of EMEMPs is overwhelmingly on preventing harm, rather than accepting that it can occur and designing strategies to address it. This leads to confusion between prevention and mitigation. At the start of project design, the focus is usually on preventing harm from occurring, not correcting it. The concept of mitigation arises when projects designed without full understanding of the environmental issues cause harm that must be corrected later. The EMEMP projects are still in the design stages, so the emphasis on prevention rather than mitigation is appropriate. This has led to "mitigation" programs focused on environmental assessment, as in Uganda, where assessments of IDEA-funded activities and support for the development of the GOU's assessment procedures through the NEAP are described as part of a mitigation strategy.

The strengthening of African countries' environmental assessment procedures is probably an effective way to protect the environment, but it does not address the problem of unanticipated harm. Sometimes EMEMPs are mandated when it is not possible to predict what the harm will be or when it is easy to predict harm but difficult to determine how likely it is. In such cases, EMEMPs are rather limited in their development of response strategies or assignment of responsibility for implementing them. In Ghana, the Environmental Protection Council was explicit in noting that mitigation would be the responsibility of the Ministry of Agriculture, and that a mechanism would be found to get it to assume that responsibility if needed. The Uganda EIR places responsibility for mitigation with USAID, but this is not reflected in the EMEMP, which largely ignores the issue of who should mitigate.

Future EMEMPs should give this issue more consideration than it has received so far. In addition to anticipating (insofar as possible) what the harm might be, trying to prevent it, and monitoring to see whether it is occurring, EMEMPs should raise the questions of what would be done if harm is observed, who is expected to do it, and what resources are needed or available for that purpose. It may not be possible to answer all of these questions, particularly concerning resource needs and provenance, but the agencies expected to respond in case of harm should be aware that the need can arise. Beyond this, planning to "cross that bridge when we come to it" may be all that can be done at this stage.

E. Causality and the logic behind an EMEMP's monitoring

A number of the criticisms of EMEMPs in this report focus on the question of what we are trying to monitor and why. The fundamental question is whether we want to, can, or will succeed in establishing a causal relation between USAID-funded activities and environmental harm. As we have seen, the EMEMPs reviewed address this issue in different ways, highlighting what a difficult problem it is. The EMEMP in Ghana asserts that showing a causal link is necessary but does not use this issue to define the data to be collected, identify needed baseline information, discuss the timing of data collection, or in any other way contribute to design of the system. In Malawi, the causality issue underlies the conflict over the choice of catchment basins for monitoring, so it has received considerable attention. The eventual conclusion was that the monitoring would not be designed to show causality statistically; instead, a related research program will be used to address such issues. In Uganda, the EMEMP

explicitly recommends against trying to establish causality through monitoring, on the grounds that it is not realistic, but does suggest research activities to show such a link. The Madagascar documents do not address the issue at all.

Showing a causal relation will be much easier in some situations than in others. This depends on how simple or complex the situation is. Where the USAID project is the only factor influencing a region, then it should be relatively easy to attribute changes in the environment to the project. Where many other variables are at work--such as other projects, policy reforms, labor migration, social unrest, or climate change--it will be more difficult to indicate whether observed environmental degradation is due to the USAID project. Of course most projects occur in contexts where many other things are happening, making it difficult to show a clear causal link between the project and the environment.

Moreover, the establishment of causality is not all or nothing. Statistical methods are used to establish a link within certain confidence intervals; this concept should frame a general approach to causality as well. Using statistical analysis we could, with the right data, assert that a particular environmental condition is related to a given activity or project with a certain probability. The ability to do this is constrained by how well we can identify all the other variables that might be causing the environmental change and whether we can collect the data that would allow us to control for them statistically. Thus, if we are concerned about whether an export promotion program causes agriculture to expand onto forested land, we would collect statistical data not only about agricultural activity and land use in forests, but also about population dynamics, fuelwood markets, and other variables that might cause a change in forest use. Some of those variables can be anticipated, but others are sure to escape consideration. We will probably also have to make a judgment about which variables are most important and concentrate data-collection resources on those, rather than trying to gather everything that might have any bearing on the matter. Even beyond the calculable margin of error in any statistical analysis, the certitude of an assessment of causality will, therefore, be related to how many of those other variables can be identified, how many resources can be devoted to data collection and how well we guess about which variables are actually important.

To reduce the uncertainty posed by the wide range of variables that could affect the environment, monitoring could be targeted narrowly. For example, continuing the previous example, instead of collecting broad statistical data about agricultural production, demography, fuelwood markets, and use of forest land, the specific farmers who have increased production in order to take advantage of the new exporting options could be identified. They could probably be found by working with agricultural extension agents implementing the USAID project. The farmers' activities would be monitored, observing whether they expand export production by cultivating previously forested land, intensifying production on existing farmland, or replacing food crops with exports. We could interview them and model their business and household decisions to determine how they make their choices and the importance of the various other variables in addition to the USAID project. If the farmers are cutting forests to increase output, we could study the impact of forest loss on wildlife, soil erosion, and availability of rangeland. We might also be able to determine what subsequent interventions might mitigate

this harm, for example, how changed land-tenure policies change the incentives to replace forests with farmland.

Through this approach we could learn about the precise impacts of the USAID project or policy reforms. Despite this apparent appeal, the approach has important disadvantages. It probably could not depend on any existing data sources because they are unlikely to be sufficiently specific to answer the particular questions of interest. The project in question would, therefore, have to fund most (if not all) of the monitoring itself. A contract to collect the data could be awarded to government agency, but the agency is not likely to perceive this effort to be an integral part of its own data collection efforts, again because of the specificity of the information required. Thus the agency would not be likely to take any ownership of it or care about ongoing funding once USAID's support is no longer available. We would not expect to see any results for several years because of the time required for the USAID project to have these kinds of impacts. Thus, we would want to collect data when USAID's funding through the project was no longer available.

This suggests that there is a tradeoff to be made between an EMEMP that aims to identify the precise impacts of a specific USAID project and one that aims to monitor the environment more generally, without necessarily being tied closely to the USAID project. The former is more likely to show a causal relation and thus to be able to identify and mitigate harm that the project might cause; this is, after all, the EMEMP's original purpose. The latter, however, might be both easier and more useful to the country. The precise environmental impacts of a USAID project are of considerable interest to USAID, but they are probably not the most pressing environmental problem in the country. More general monitoring can help to flag environmental concerns of greater importance to the country, although it could not identify precisely what caused them. In a context where little environmental information is available, broader, more general data covering, perhaps, a large geographic area somewhat sparsely may be more valuable than data covering a small area very densely.

This is the approach that EMEMPs considered in this study have taken. Some of them assert the need to show a causal link between the USAID project and the environment, but the only effort that offers much chance of doing this is the farmer-and-processor surveys proposed in Uganda. Other EMEMPs propose to collect more general data, which concern the regions affected by the project at hand, but which will not be adequate to show the project's effects.

If this strategy helps a government in its own environmental monitoring activity, it is a reasonable approach. Instead of collecting general data related to the USAID project, however, it might be worthwhile to consider the possibility of supporting the collection of whatever data the government considers most useful. Though it might be surprising to suggest that monitoring for an EMEMP not try to target its own project, the current compromises may not be useful to anyone. They are not precise enough to show causality but may still focus on issues that are not particularly important from the perspective of overall national data needs. Instead of focusing on the area of the country the USAID project is most likely to affect, for example, the EMEMP might focus on the area most likely to be experiencing serious environmental degradation or

where the consequences of that degradation might be most harmful to the population. This approach would treat an EMEMP as a resource available to meet priority environmental information needs and break the link with the particular impacts of the USAID project. Without recommending this approach in any particular case, it is an option to consider in the design of future EMEMPs, especially when it will be difficult to demonstrate a clear link between the project and the environment.

F. Causality and research support

Several of the EMEMPs considered in this study complement their general monitoring efforts with funds for research that could help establish a project's impact on the environment. Through this approach, the narrowly targeted approach to data collection described above could be conducted as a research project on the impacts of USAID-promoted policy reforms on land degradation. Such research, combined with broad data collection that showed how widespread the problems actually are, would constitute an effective way of both supporting host-country information systems and understanding how policy reforms affect the environment. Moreover, if well designed, the results of the research component might be transferable to other countries, making them of interest far beyond the project that generated the EMEMP. For example, the possible environmental impacts of USAID programs often depend on whether farmers respond to increased market opportunities by intensifying or by extensifying their production. A research project that examined the circumstances under which farmers choose each option might produce results applicable to other projects, and possibly to other across countries as well.

In practice, the effectiveness of research under the EMEMP umbrella will depend on how the research program is designed and how its funds are allocated. In Uganda and Malawi, the research funds are provided to government agencies that apply their own criteria in deciding how to use the money; the decision to view the research program as a component of the EMEMP does not give the EMEMP's designers jurisdiction over allocation of the funds. As in the case of environmental information, the government's research agenda may not be the same as USAID's, and research agencies will allocate resources to reflect their own priorities. USAID staff involved with the research programs may also not be interested in environmental issues. The research funds usually come from the agriculture projects that required the EMEMP, and the project officer's interest is more likely to be agricultural development than environmental protection.

For these reasons, bringing a research program under the umbrella of an EMEMP may not be adequate to ensure that the environmental impacts of the USAID project are addressed. Instead, it may be useful to give the research activity the same importance as the EMEMP's monitoring component, with the research agenda and purpose clearly defined. Funding for the research activity should be allocated from the EMEMP's budget, rather than assuming that research funds already programmed with other objectives can be diverted to serve the EMEMP. The Bureau for Africa, rather than individual mission or projects, might even define the overall research agenda to maximize the opportunity to transfer results from one project or country to another. The agenda might focus in several related areas: impacts of policy reforms on

agricultural activity, relation between income growth and the environment, impact of agricultural expansion on the environment, and developing agricultural techniques that maximize output while minimizing environmental impacts. Although ecological factors would limit the transferability of some results, other results, such as the development of frameworks for determining whether farmers will expand output by expanding or intensifying agriculture, should be of broad interest across countries. Two literature reviews recently conducted with USAID support (Temel and Roe 1994; Rock and O'Keefe 1994) should provide useful input into the definition of a research agenda in this area.

This discussion does not lead to a single "right" answer on the causality issue. Establishing a causal relation between an agency project and environmental harm is likely to be impossible even in the simplest of situations, and no situation is simple in reality. Perhaps the best approach would be to combine general support for development of environmental information systems within the government with funding for a specific research program to examine the link between the project in question and the environment. This combination could cost more than the project can (or is willing to) spend, however. An alternative might be to concentrate available resources on development of environmental information systems and search the literature for other research results that might offer insights into the environmental impacts of the project at hand. In any case, designers of future EMEMPs must consider these issues explicitly, rather than leaving the issue largely implicit. They should identify and justify their choices among these options, and the monitoring, baseline data collection, time frame, and research they propose should clearly be an outcome of those choices.

G. The sustainability issue

This review of EMEMPs highlights the importance of introducing the concept of sustainable development into project and program design. This is an important part of the DFA's objectives (see, for example, USAID 1993), but in practice sustainable development has not yet been incorporated fully into project and program design. At present the activities that have generated EMEMPs define their objectives in terms of increases in agricultural output, incomes, or exports. At the mission level, ultimate goals can be defined as sustainable increases in income, but strategic objectives omit the word "sustainable." Consequently, at both the mission and project level, indicators and monitoring systems are designed to show that incomes are increasing, but no one is required to demonstrate that such increases are sustainable. This can be observed by reading the API documents and the PRISM reports, which refer to sustainability at the goal level but omit it when developing indicators at the objective, subobjective, and project levels. Moreover, even when used at the goal level, the word "sustainable" is not defined; it could mean either an economic or biological concept of sustainability. The latter is more restrictive than the former; activities can be economically sustainable by converting natural resources into other, more productive forms of capital without being biologically sustainable.

The integration of the concept of (biologically) sustainable development into the design of project and mission objectives, and thus into the design of indicators used to evaluate projects

and mission programs, would have overwhelming implications for the accomplishment of an EMEMP's objectives. If the concept of sustainable development were actually integrated into USAID's frameworks for evaluating the impacts of its activities, it would be insufficient to achieve only increases in incomes; projects and missions would also be required to demonstrate that the increases are sustainable.

This would require, of course, that sustainable increases in output be defined, and this will be a thorny problem. In biological terms, agricultural practices like those introduced in USAID's export promotion projects might increase output in the short run but harm the resource base on which they depend, so they can be maintained for only a few years. Such increases would fail both biological and economic tests of sustainability. Other agricultural practices, however, might harm a *different* resource base, reducing someone else's productive potential but having no direct bearing on the activity causing the problem. For example, careful and cautious use of pesticides might lead to increased production with no long-run harm to soil, fields, or the safety of the produce but nevertheless pollute downstream fisheries. From a biological perspective the activity could continue indefinitely. Nonetheless, this would not be biologically sustainable because the activity is still causing environmental harm elsewhere in a larger system.

The economic concept of internalizing externalities offers language useful in thinking about the definition of sustainability. Defining project objectives in terms of sustainability might be equivalent to requiring that all project-related externalities be internalized. That is, either the design of the project would have to be environmentally harmless, or in some (not yet defined) way, the project would have to bear the costs of any harm it might cause or mitigation it might require.

The fisheries example above might suggest what this means in practice. If a project's objective is "sustainable increases in production," then it would either have to be designed to avoid any harm from using pesticides or that harm would have to be mitigated. A biologist would consider this mitigation sustainable if a mechanism were found to protect the fish from pesticide harm. An economist would consider it sustainable if the incomes of the fisherfolk were protected. Incomes could be protected by transferring resources from the newly wealthy farmers to the fishing community to replace its fishing income, or by finding new jobs in food processing that enabled members of that community to leave the fishing industry.

The monitoring system would then have to determine whether farmers are using pesticides and, if so, show that any harm to the downstream fishery is mitigated, either in biological or in economic terms (depending on how "sustainability" is defined). This would be part of the demonstration of project success, so it would be integrated into the M&E system itself, rather than being part of a separate EMEMP system. Although nothing would change in technical terms--environmental experts would still be needed to design ways to prevent harm, monitor it, and, if needed, mitigate it--this redefinition of objectives would change the incentive structure of project managers with the stroke of a pen. No longer would the environment be a concern imposed by outsiders from Nairobi, Abidjan, or Washington. Instead the environment would be part of how a project is evaluated, and commitment to the EMEMP's objectives would

probably grow. Perhaps this assessment is wildly optimistic. Nevertheless, it would seem that in the pursuit of an EMEMP's objectives, regional and bureau environment officers should work for this definition of project or program objectives as perhaps the most effective way to create strong support for environmental monitoring and protection. This would require environmental staffs to participate in aspects of the design process that do not now involve them; their input would no longer be limited to IEEs or EMEMPs but would also pertain to a project's or program's fundamental objectives.

H. Linking EMEMPs to other USAID monitoring

Several EMEMPs recommend the linking of environmental monitoring to data collected through other USAID projects, usually environmental ones. Thus the EMEMP in Uganda is expected to rely on data the APE collects, and Madagascar's EMEMP may rely on KEPEM and SAVEM. This strategy makes good sense. If two projects need the same data, they should pool their efforts and design complementary systems, in order to share data rather than duplicate efforts.

In practice, it is not clear that this approach will work. Cooperation between two USAID projects in the same mission should be straightforward, but it seems to be only slightly easier than interdonor cooperation, which is notoriously difficult. In most cases the projects are designed separately, by different teams, with different objectives, often focusing on different aspects of the environment and different parts of the country. Their data collection strategies are not designed jointly, and the funds are not managed jointly. This is clear in Uganda. The APE's project team is willing for the EMEMP (or anyone else) to use its data, but this staff is not willing to allocate the APE's resources to any data collection or processing that the APE does not need for its own purposes. Moreover, reallocation of the APE's funds to meet the EMEMP's needs would not be a way to benefit from complementarity between the projects; it would be diverting the resources of one project to meet the needs of the other. The same problems may arise in Madagascar, where KEPEM and SAVEM are expected to provide data for the CAP's EMEMP.

This is not to conclude that it is impossible for an EMEMP to rely on data another project produces. The extent to which it is feasible will depend on how much the two projects overlap substantively. There seems to be an assumption in the EMEMPs reviewed for this study that if there is an environmental project with funds for data collection, then it will be able to provide the data that an EMEMP needs. Technically this may be impossible. If the two projects work in different parts of the country or on different environmental issues, they will not be able to share relevant data.

Even when the technical differences between the two projects can be bridged, it will require considerable work and goodwill to do so. Insofar as possible, the projects' efforts to collect data should be designed jointly, so that the one on which the EMEMP expects to depend has not already made all of its plans before learning about the proposed collaboration. The EMEMP's designers should identify precisely what data the other project will collect and how the needs of the two activities are related. This will determine whether one project can provide

information to the other without generating additional costs. The EMEMP's designers must proactively engage the staff of projects whose data they hope to use; such collaboration will not happen merely because an EMEMP document asserts that a project not under its jurisdiction will provide data.

The strategies for cooperation among projects may change as USAID moves towards funding at the strategic-objective level rather than at the project level. None of the countries studied are operating this way now, but the Madagascar case suggests how this could work. In Madagascar, four or five projects are supporting agribusiness development, with their activities complementary and their objectives similar. Their environmental impacts can also be expected to be similar, if not entirely indistinguishable; thus the CAP's EMEMP is to cover the MIX project and MAELSP as well. As missions move toward integrated programs, it will be appropriate to approach environmental monitoring at the mission level rather than at the level of the individual project. Funding for the EMEMP would also be allocated at the strategic-objective level. The mission's M&E staff, or, more likely, the contractors with a specific assignment to deal with cross-cutting environmental monitoring might manage the EMEMP.

This approach will be most effective when a mission's objectives are defined in terms of sustainable growth. If objectives do not include sustainability, a mission-level EMEMP could become quite removed from the individual projects, which could easily avoid responsibility for the environment altogether. If growth must be sustainable, however, both project and mission staff will have a strong interest in ensuring that the EMEMP is effective because no activity will be deemed an overall success if it is not an environmental success as well.

This approach would not necessarily solve the problems of cooperation between environmental projects and those for which EMEMPs are required. Even with a more programmatic and less project-based approach, the environmental projects might not address the issues that EMEMPs raise. For example, environmental projects might focus on conservation and biodiversity, whereas EMEMP projects might raise problems of erosion and water pollution. In such a case the data requirements for the two sectors would be technically distinct. Calling on the environmental projects to provide data to the EMEMPs would broaden their mandate to include provision of all environmental data. This allocation of responsibility might be appropriate in light of the expertise of people in different sectors. This decision would be made on the basis of management considerations, however, and not be based on efficiencies achieved through data sharing, since it could still be technically impossible to share data.

I. Linking EMEMPs to government activities

The EMEMPs studied in this report show two distinct patterns for linking African governments to the implementation of EMEMPs. The first is the approach followed in Ghana, where the government has full responsibility for the EMEMP's implementation, including paying for it. The second, and more typical approach, is found in Uganda and Malawi, where government agencies will have responsibility for specific data collection activities with USAID funding, but general responsibility for implementation of the EMEMP will remain with USAID.

Ghana offers an interesting model, but it may not be transferable to other countries. Full government responsibility for the EMEMP was an option (albeit still unproven) in Ghana because there was a strong institution that wanted this role. Ghana's EPC took a lead in the NEAP process and is responsible for implementing its information systems component. The EPC was, therefore, also interested in the EMEMP. Few countries will have a similar strong institution willing and able to implement an EMEMP. Even where there is a NEAP, its existence is not sufficient to ensure the level of ownership evident in Ghana. The preparation of a NEAP can be a strong participatory process, but it is not necessarily that, especially when donor agencies impose it. Therefore, while an EMEMP's designers should be open to opportunities to adopt Ghana's approach, they will not be able to foster it if the interest is not already there.

The second strategy, while more limited in the level of the government's responsibility, is more realistic in most cases. The specific determination of which tasks are contracted to government agencies, with what kind of expatriate assistance, depends on the project, the environmental context, and the government's capabilities. As in the design of any project, tradeoffs will be made between collecting the data quickly and reliably by depending on expatriate technical assistance, on the one hand, and building government capacity to collect data, on the other. Three factors affect this tradeoff. One concerns the need for the data. An EMEMP designed narrowly to target the detailed impacts of a particular activity, which needs specific data on a clearly defined time schedule, will not be well suited as a vehicle for institution-building. In contrast, an EMEMP designed to build more general monitoring databases can more easily afford the costs of serving as a training and institution-building tool because it is less essential that specific data be available at a particular time. Thus a decision not to be too concerned about showing causality may be consistent with a greater focus on institution-building within the government.

A second factor concerns how to maximize the probability that such a system will continue once USAID's funding is no longer available. Few African governments have the operating funds needed to maintain data collection systems without donor support. Accordingly, the more closely the data being collected respond to government needs, rather than those of the USAID project, the more likely the government will be to sustain it once USAID's funding ends. (For that matter, the more the data relate to national needs, the more likely other donors will be to step in once USAID steps out, as well.) This argues for using EMEMP support for environmental information priorities the government identifies, rather than focusing more closely on the impacts of a specific project.

The third factor could argue the other way, however. Donor funding can take two different forms. One, perhaps more common, is for donor aid to be an investment in the development of a system that will continue to operate with (African) government funds in the future. The second is for the donor aid to be a grant for a discrete activity not expected to become operational. This is typical of how research institutions are funded, in Africa as in the west. Although such institutions prefer to develop their own research agendas, in practice their funding options are such that they often behave like contractors, taking any work that provides

resources to keep them operating. The individual research project is a discrete activity, amenable to one-time lump-sum funding (although, of course, institutionalizing the implementation of its results within another government agency would raise issues about ongoing funding sources). This may be exactly the kind of organization that could take on a targeted research project on the impacts of a specific USAID project on the environment. Here the issues of linking an EMEMP's data collection to a government's information priorities and establishing a system that will continue to operate without USAID funding will not be relevant, and it should be easy to transfer responsibility to the government.

Chapter 4. Summary of Recommendations

This review has considered how EMEMPs are being designed and implemented in Ghana, Malawi, Uganda, and Madagascar. It has used the experience of those countries to identify the major issues that EMEMPs pose, to learn how they can be handled elsewhere in the future, and to suggest to the Bureau for Africa new strategies or approaches for consideration in responding to the environmental impacts of its activities. Several major recommendations emerge from this discussion:

- The Bureau for Africa should adopt *sustainable* income growth as the objective of its projects and mission-level programs and define its frameworks for monitoring and indicators at the project, program, and mission levels accordingly. This will have profound effects on the integration of environmental considerations into project design and evaluation because both projects and mission programs would be judged not only on whether incomes rise but also on whether those rises are environmentally sustainable. Such an approach will require explicit consideration of the definition of "sustainability," particularly whether it should be understood in biological or in economic terms.

- The designers of EMEMPs should address explicitly the issues of whether or to what extent it is possible to show a causal relation between project activities and environmental change. This will normally involve a tradeoff between showing a causal relation and supporting the development of routine monitoring data of general use to the government, donor agencies, NGOs, and other interested groups. If establishing a causal relation is not possible, then the government's priorities for environmental information systems should be an important criterion in determining what the EMEMP will do; monitoring associated with EMEMPs should not be limited to environmental concerns specifically related to the USAID project.

- If the EMEMP's designers believe it is feasible to establish a causal relation, then all recommendations for monitoring, choice of indicators, choice of baseline data, time frame for both baseline data and monitoring, and design of research activities should be justified clearly in terms of how they will contribute to demonstrating that relation. Monitoring that cannot be justified in those terms should be omitted or justified in some other way.

- The Bureau for Africa's environmental staff should develop a broad agenda for research funded through EMEMPs. It should focus on four major issues that are key to understanding, preventing or mitigating environmental harm that Bureau projects or programs might cause: links between policy reform (particularly agricultural policy) and agricultural activity, the relation between income growth and the environment, the impact of agricultural expansion on the environment, and the development of biologically sustainable agricultural practices.

- An EMEMP that recommends research as a means of showing causality or mitigating

environmental harm should include a detailed research design and identify specific funding for that purpose. Lump-sum contributions to independent research programs will not suffice to ensure that issues relevant to EMEMPs are addressed adequately.

- As missions move towards funding at the strategic objective level, the designers of EMEMPs should investigate environmental monitoring at that level, rather than at the project level. This can be considered an extension of the joint EMEMP strategy now being pursued for the ANEP and IDEA in Uganda and for the CAP, MIX, and MAELSP in Madagascar.

- Designers of EMEMPs interested in relying on secondary data sources, whether from the host government or other USAID projects, should contact the producers of those databases to determine what they contain. This is a prerequisite for designing an EMEMP that depends on secondary data. Such contact cannot wait cannot wait until the EMEMP implementation team begins work because the costs of changing methodology will be high if available data are inappropriate.

- Similarly, an EMEMP's designers interested in obtaining data from USAID's environmental projects should work closely with the managers of those projects before an EMEMP is completed in order to assess the technical feasibility of sharing data. No assumptions should be made about the availability of data from other projects if the managers of those projects do not concur.

Documents Consulted

Editor's note: As the reader will quickly notice, many of the citations that follow are incomplete. This reflects the kinds of materials used and the fact that many of items are not intended for general circulation, that is, many are internal working documents or communications.

General:

Chew, Siew Tuan. 1988. *Environmental Assessment of Development Projects: A Preliminary Review of A.I.D.'s Experience*. Evaluation Occasional Paper No. 17. Washington, D.C.: USAID.

Goodson, Jeffrey Wiley. 1987. *USAID Environmental Regulations and Foreign Assistance Act Environmental Requirements: A Practical Guide and Strategy Tips for AID Project, Program and Technical Personnel.* Abidjan: USAID/REDSO/WCA.

Hecht, Joy, Kjell Christophersen, and Swarupa Ganguli. 1991. *Environmental Assessment in Africa*. Final Project Report. Washington, D.C.: International Resources Group.

Hecht Joy, G. Edward Karch, Scotty Deffendol, Joseph A. Tabor, James Keith, Robert Hanchett, and Darrel Plowes. 1993. *Agricultural Trade Policy Reform Program: Design of an Environmental Monitoring System*. Washington, D.C.: Chemonics International.

Knausenberger, Walter. 1994. Personal communication regarding: Joy Hecht's draft paper, *EMEMP: Review of the Experience in Four African Countries*. Washington, D.C.

Rock, Michael, Sinikka DeHanas, J. Frank McCormick, and Mark Renzi. 1992. *Assessment of the Advisability of Delegating Environmental Authorities to Bureau for Africa Field Missions*. Technical Report No. 9. Arlington, Virginia, USA: EPAT/Winrock International.

Rock, Michael and Kevin O'Keefe. 1994. *Nonproject Assistance and the Environment: What we Know and Don't Know.* Draft paper. Arlington, Virginia, USA: EPAT/Winrock International.

Rogers, Glenn. 1993. *Uses of New Databases for Program Impact Analysis*. Abidjan: USAID/REDSO/WCA.

Rogers, Glenn. 1994. *Support of Spatial Data Analysis in Guinea: Background and Proposed Action Plans*. Abidjan: USAID/REDSO/WCA.

_____. 1994. Program Monitoring and Evaluation. Trip report. Abidjan: USAID/REDSO/WCA.

Samba, Idrissa, Barry Rands, and Hammadou Bourahima. 1994. Community-Based Gouré NRM Interventions (683-0278) CB-EMEMP Report on mission to Niger.

Taylor, Serge. 1984. *Making Bureaucracies Think: The Environmental Impact Statement Strategy of Administrative Reform.* Stanford, California, USA: Stanford University Press.

Temel, Tugrul T. and Terry L. Roe. 1994. *The Impacts of Structural Adjustment Program on Agricultural Marketing Process in Ghana: A Survey of the Literature.* Draft. St. Paul, Minnesota, USA: Department of Agricultural and Applied Economics, University of Minnesota.

USAID. 1992. *Africa Bureau Non-Project Sector Assistance.* Washington, D.C.: Africa Bureau, USAID.

_____. 1993. *Towards a Sustainable Future for Africa: Improved Natural Resources Management under the Development Fund for Africa, 1987-1993.* Technical Paper no. 5. Africa Bureau, Office for Analysis, Research and Technical Support. Washington, D.C.: USAID.

_____. 1994. *Results-Oriented Operations Reengineering.* Draft Report. Washington, D.C.: USAID.

U.S. Department of State. 1994. Cable requesting update on status of EMEMP implementation (State cable 016256). Washington, D.C.: U.S. Department of State.

U.S. General Accounting Office. 1994. *International Environment: Improved Procedures Needed for Environmental Assessments of U.S. Actions Abroad.* GAO/RCED-94-55. Washington, D.C.: U.S. General Accounting Office.

White, Louise. 1986. *An Approach to Evaluating the Impact of USAID Projects.* Program Design and Evaluation Methodology Report No. 5. Washington, D.C.: USAID.

Ghana:

Amekor, Emmanuel M. K. and Idrissa Samba. 1994. Evaluation of the Implementation of the Ghana Trade & Investment Program Environmental Monitoring, Evaluation, and Mitigation Plan. Ghana: USAID.

Destler, Harriett, Paul Tuebner, Alan Lessik, and Keith Brown. 1993. *Monitoring Program Performance: USAID/Ghana.* Prepared under the PRISM Project, USAID Center for

Development Information and Evaluation. Management Systems International, Labat-Anderson, Inc., and Research Triangle Institute.

Dorm-Adzobu, Clement. 1992. Initial Environmental Examination, Ghana Trade and Investment Program. Included as Annex O of the TIP PAAD. Accra: Environmental Protection Council.

Dorm-Adzobu, Clement and Idrissa Samba. 1992. N.T.E. Environmental Monitoring, Evaluation and Mitigation Plan. Included as Annex O of the TIP PAAD. Accra: USAID/Ghana Trade and Investment Program.

Dworkin, Dan. 1993. Ghana TIP Monitoring. E-mail to Forrest Swick. Washington, D.C.: ARTS/FARA.

Thrupp, Lori Ann, Peter Veit, Clement Dorm-Adzobu, Okyeame Ampadu-Agyei. 1992. *Environmental Impact Review of the Nontraditional Agricultural Export Sector in Ghana.* Annex U of the TIP PAAD. Accra: USAID/Ghana: Trade and Investment Program.

USAID/Ghana. 1992. TIP Monitoring and Evaluation Plan. Annex N of the TIP PAAD. Accra: USAID/Ghana.

Veit, Peter. 1993. Memorandum to Tom Fox, Walter Arensberg, WRI Center staff, Walt Reid, Paul Faeth, Sarah Burns. Trip report/Ghana. Washington, D.C.: World Resources Institute.

World Bank. 1992. "The Environmental Information System." Working Paper 3 (draft). Ghana Environmental Resource Management Project. Washington, D.C.: World Bank.

_____. 1992. "Monitoring Environmental Quality." Working Paper 4. Ghana Environmental Resource Management Project. Washington, D.C.: The World Bank.

_____. 1993. Ghana Trade and Investment Program (TIP) Environmental Monitoring, Evaluation, and Mitigation Plan (EMEMP) Work Program for 1993.

World Resources Institute. 1993. Scope of Work for TDY to Ghana to work on the Environmental Monitoring, Evaluation, and Mitigation Plan. Washington, D.C.: World Resources Institute.

Malawi:

Agricultural Sector Assistance Program (ASAP) Mid-Term Evaluation.

Brunner, Jake and Peter Veit. 1993. Memo to Dan Dworkin on Malawi's ASAP II.

Brunner, Jake, Daniel Dworkin, and Charles Hutchinson. 1993. *Malawi Agricultural Sector Assistance Program Environmental Monitoring Sub-Activity*. Mission Report and Recommendations. Lilongwe: USAID.

Burger, W. K.. 1993. MEMP Monthly Summaries for November and December.

Chimwaza, S.J.. 1992. *The Handling of Geographic Information in Malawi: Current and Potential Uses of GIS*. Paper presented at the SADDC Regional Workshop on Geographic Information Systems for Natural Resource Management. Harare.

Department of Research and Environmental Affairs. 1993. Environmental Monitoring Program for Malawi. Lilongwe.

Dworkin, Daniel. 1993. *Malawi Agricultural Sector Assistance Program: The Environmental Monitoring, Evaluation and Mitigation Plan*. Washington, D.C.: USAID.

_____. 1994. Review of the progress of the Malawi ASAP EMEMP. Trip report draft. Washington, D.C.: USAID.

Eastman, J. Ronald and James Toledano. 1994. *Sustainable Technology Transfer under the Malawi Environmental Monitoring Program*. Worcester, Massachusetts, USA: Clark University.

Eastman, J. Ronald and James Toledano (in cooperation with Charles Hutchinson and Kent Burger). 1994. *The Malawi National Environmental Information System: A Commentary and Proposal*. Worcester, Massachusetts, USA: Clark University.

Hutchinson, C. F. and R. A. Hay. 1994. "Report and Recommendations on Areal Video Survey and Interim Program Assessment: Malawi Environmental Monitoring Program." Tucson: Arizona Remote Sensing Center, University of Arizona.

Loken, Eric. 1992. *Malawi ASAP Environmental Monitoring Sub-Activity: Outstanding Issues*.

_____. 1993. Comments on the Brunner et al. mission report of February 1993.

Malawi Agricultural Sector Assistance Program. n.d. Environmental Monitoring Sub-Activity. Brief description.

_____. n.d. Environmental Monitoring Sub-Activity, Land Husbandry Component.

Malawi Environmental Monitoring for Sustainable Agriculture Project. n.d. Work Plan Outline for the Land Resources and Conservation Branch of the Ministry of Agriculture.

USAID, Bureau for Africa. 1993. *Implementation of an Environmental Information System for Malawi*. Concept paper. Washington, D.C.: USAID.

USAID/Malawi. 1992. Assessment of Program Impact FY 92 USAID/Malawi. Lilongwe: USAID.

_____. 1993. Assessment of Program Impact FY 93 USAID/Malawi. Lilongwe: USAID.

_____. 1994. Cable to John Gaudet on Environmental Monitoring, Evaluation, and Mitigation Activities. Lilongwe: USAID.

Uganda:

Agricultural Nontraditional Export Promotion Program/Project. 1993. Environmental Monitoring, Evaluation and Mitigation Plan (EMEMP).

Brown, Keith and Tom Harrington. 1993. *Monitoring Program Performance*. Preliminary draft report prepared for USAID/Uganda. Washington, D.C.: Management Systems International.

Brusberg, Frederick E. 1993. *Monitoring and Evaluation System for the National Environmental Action Plan*. Prepared in Kampala, Uganda. Gainesville: Tropical Research and Development, Inc.

Brusberg, Frederick E., Peter Trenchard, and Ludovica Cervi Iskjaer. 1994. *Monitoring Conservation and Development of Ugandan Protected Areas for the NEAP Action Program for the Environment*. Prepared for USAID/Uganda. Gainesville: Tropical Research and Development, Inc.

Hawley, Jonathan. 1994. Draft proceedings of the PRISM/USAID Uganda Data Providers Workshop.

Iskjaer, Ludovica Cervi. 1994. *Management Support for Uganda National Parks*. Consultancy report, Action Program on the Environment (617-0124). Submitted to USAID. Gainesville: Tropical Research and Development, Inc.

Knausenberger, Walter and R. Rwampororo. 1994. Cable from USAID/Uganda to John Gaudet on the status of EMEMP activities for the ANEP and IDEA projects. Washington, D.C.: USAID.

Krahl, Lane. n.d. *A Suggested Framework for an Environmental Impact Assessment Process in Uganda*. Presented to the EIAs and Standards Working Group, NEAP Secretariat.

Loken, Eric. 1993. Trip Report, Uganda TDY, 8-17 September.

_____. 1993. Briefing Paper, IDEA and ANEP/P Environmental Monitoring, Evaluation, and Mitigation Plan.

_____. 1994. IDEA and ANEP Environmental Monitoring, Evaluation, and Mitigation Plan.

Morton, Ashley, Andrew Sergeant, and Michael Smedley. 1994. Environment Impact Review of the Investments in Development of Export Agriculture (IDEA) Project (617-0125) and Agricultural Nontraditional Export Promotion (the) Program/Project (617-0113/0114). Kampala: USAID.

PRISM Exercise Statement of Work for Mission. 1994.

Project Grant Agreement for the Investment in Developing Export Agriculture. 1993. IDEA Project Paper and Technical Annexes (USAID Project No. 617-0125). Washington, D.C.: USAID.

Trenchard, Peter. 1993. *Planning Workshop: A Baseline Review of the Department of Environmental Protection.* Prepared for the Department of Environment Protection, Kampala. Gainesville: Tropical Research and Development, Inc.

Turyatunga, Frank. 1990. *Assessment of Users' Needs for Geographical Information Systems and Remote Sensing for Renewable Resources Management.* Draft. Washington, D.C.: World Bank Environment Division, Africa Region.

USAID/Uganda. 1994. Cable to John Gaudet on status of EMEMP activities for ANEP and IDEA.

Madagascar:

Knausenberger, Walter. 1994. *Madagascar Commercial Agricultural Production Project Initial Environmental Examination.* Washington, D.C.: USAID.

Loken, Eric and Walter Knausenberger. 1993. *Environmental Analysis: Madagascar Commercial Agricultural Promotion Project and Agribusiness Support Activities of USAID/Madagascar.* Washington, D.C.: USAID.

Termes de Référence No. 3: Assistance technique auprès de l'ONE pour l'Organisation et la mise en place d'un système d'informations sur l'environnement. n.d. From the RFP for an African Development Bank project for the implementation of the Environmental Action Plan.

People Contacted

Ghana

Akiwumi, William	Monitoring & Evaluation Specialist, USAID/Ghana
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